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(54) Hand grinding tool comprising a composite structure

(57) The invention relates to a grinding tool (1) for grinding a surface by hand, said tool comprising a composite layer structure. The structure includes a basis lay-

er (2) with a grinding surface (4), at least one grip layer (3) and means (6,10) for binding said metal and said at least one grip layer (3) together, and gripping means (5) fastened onto said at least one grip layer (3).

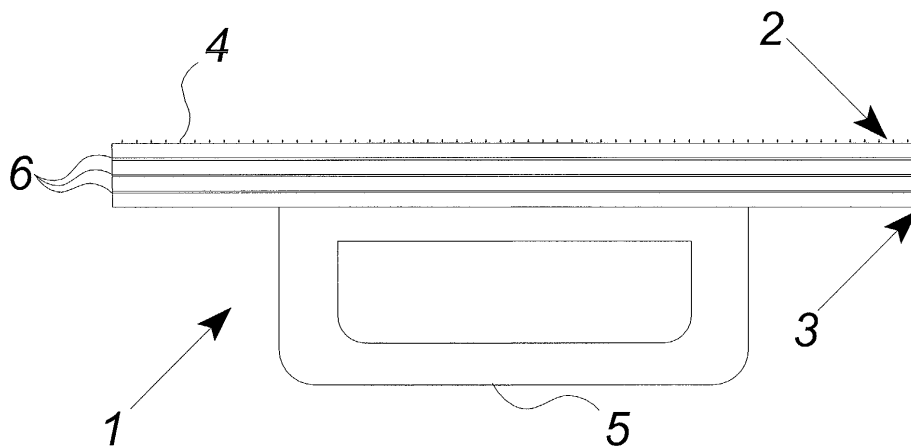


Fig. 2

Description

Background of the invention

[0001] The present invention relates to grinding tool for grinding a surface by hand.

[0002] So far, known grinding tools of hard metal have only been produced in steel plates with sizes of 2 to 3 mm on which the grains are soldered directly onto the bearing part of the construction and with sizes of 200 to 250 cm² with a handle welded or tightened onto the tool. Initially, they were produced for the floor business for grinding edges and minor floor spaces, where the weight of the grinding tool was of little importance due to the work position.

[0003] Another known method is to mount sandpaper onto a traditional grinding tool by means of pins, screws or spring-loaded clamps.

[0004] Due to the application of many new materials, especially the building industry has a growing need to be able to adapt and grind the building elements and the materials in general.

[0005] The known choice of material for production of tools with a solid self supporting steel plate results in too much dead load and thus introduces a limit to the size of grinding tools which can be applied.

[0006] First of all, sandpaper is outdated as it has a limited grinding effect. Secondly, sandpaper, where applicable, has short endurance resulting in a lot of replacements.

[0007] The object of the invention is to create a grinding tool without the above-mentioned drawbacks.

The invention

[0008] The object is achieved by a grinding tool for grinding a surface by hand, said tool comprising a composite layer structure including a basis layer with a grinding surface, at least one grip layer and means for binding said metal and said at least one grip layer together, and gripping means fastened onto said at least one grip layer. Hereby, it is possible to provide a grinding tool which is light-weight and thus user-friendly.

[0009] Especially, it is important and advantageous that people who frequently work with grinding tools are supplied with light-weight tools. Too heavy tools may cause fatigue and permanent damage to arms and backs over time.

[0010] The phrase "composite layer structure" is to be understood as at least two different materials connected to each other in a given layer structure.

[0011] In a preferred embodiment, said basis layer is a steel plate which makes it possible to use an efficient grinding medium with hard metal grains, such as carbide grits, fastened onto the steel plate. At the same time, the steel plate is durable and strong with a very small thickness.

[0012] In another preferred embodiment, said com-

posite layer structure includes at least two different materials which makes it is possible to create a composite structure. The composite structure includes a basis surface and at least one layer of a material with a lower mass density than the basis layer. By this structure, a light-weight tool may be obtained by replacing some of the basis layer material with lighter materials.

[0013] In a further preferred embodiment, said grinding surface includes hard metal grains fastened onto said basis plate by soldering, brazing, welding, gluing or the like which makes it is possible to obtain a efficient grinding tool which is also durable.

[0014] In an even further preferred embodiment, said basis plate includes one or more edges bent downwards in relation to said at least one grip layer which makes it possible to create a tool in which the basis layer holds and/or protects the grip layers. Especially, the possibility of protecting the connection between the layers against moisture or the like is advantageous and may prolong the lifespan of the tool.

[0015] Also in a preferred embodiment, when said at least one grip layer is a plate of wood, plastic such as PVC or similar synthetic materials, coal fibers, a metal such as extruded aluminum with internal ribs or the like. It may also be a combination of plates comprising wood, plastic, a metal such as extruded aluminum with internal ribs or the like, whereby it is possible to create a light-weight tool by replacing some of the basis layer material with lighter materials.

[0016] In a preferred embodiment, said at least one grip layer comprises a layer of PVC, coal fibers or a similar synthetic material between a first and second aluminum layer, which makes it possible to create a tool which is light but still strong, rigid and durable.

[0017] In another preferred embodiment, the thickness of said layer of PVC, coal fiber or a similar synthetic material is between 1 and 20 millimeters, preferably between 2 and 5 millimeters, and the thickness of said first and second aluminum layer is between 0.1 and 5 millimeters, preferably between 0.2 and 0.5 millimeters, whereby a preferred tool design with an advantageous relation between weight and strength/rigidity/durability has been obtained.

[0018] In a preferred embodiment, said gripping means is a handle or a stick attached to said at least one grip layer by fastening means such as soldering, brazing, welding, gluing or use of nails, pins, screws or the like which makes it possible to fix the layers to each other in a strong and durable manner and thereby ensure a long lifespan of the tool.

[0019] Hereby, a grinding tool with the same known efficiency as that known from hard metal is achieved, but with a low dead load, which facilitates the production of grinding tools in all sizes and geometric shapes.

[0020] The grinding tool can be applied for grinding of all kinds of building materials, glass fibre, epoxy paint, varnish, filler and so on.

The figures

[0021] The invention will now be described in detail with reference to the drawings, in which

- fig. 1 shows an exploded view of a preferred embodiment of a grinding tool according to the invention,
- fig. 2 shows the preferred embodiment of grinding tool seen from the side,
- fig. 3 shows the separate layers of the preferred embodiment of the grinding tool, and
- fig. 4 shows a further embodiment of the grinding tool according to the invention.

Detailed description

[0022] Fig. 1 shows an exploded view of a preferred embodiment of a grinding tool 1 according to the invention.

[0023] The grinding tool 1 comprises a number of layers which are fastened onto each other in a composite layer structure.

[0024] The basis layer 2 is a steel plate with a grinding surface 4 in which the grinding surface comprises hard metal grains. The grains may be fastened onto the surface by soldering, brazing, welding, gluing or the like.

[0025] The basis layer 2 may take on a number of different shapes such as plane or bent to one side or more sides for grinding corners and so on.

[0026] The grip layers 3 comprise one or more layers with a mass density lower than that of the basis layer 2. The grip layers 3 may be a plate of wood, plastic such as PVC or similar synthetic materials, coal fibers, metal or the like, or combinations of plates comprising wood, plastic, metal or the like.

[0027] One of the grip layers is in direct contact with a handling means 5 such as a handle or a stick. The handle or the stick may be connected to a grip layer by gluing, soldering, brazing, welding or a similar technique. Further, the handle or the stick may be connected to some or all the layers by using different fastening means (shown as 10 on fig. 4) such as rivets, nails, pins, screws, screw bolts which, when angled in relation to the layers, penetrate the different layers e.g. in a manner perpendicular to the layers.

[0028] The fastening means (shown as 10 on fig. 4) such as rivets, nails, pins, screws, screw bolts may also be used to fasten the layers to each other.

[0029] Further, different fastening techniques may be used to fasten the layers to each other e.g. soldering, brazing, welding or gluing. Even further, the at least one grip layer may be filled onto the basis layer, e.g. by using fluent plastic or a metal poured on the steel plate.

[0030] In a preferred embodiment, the fastening tech-

nique may be used in connection with different fastening means, e.g. glue between the layers and two screw bolts fastening the handle or the stick to the layers and fastening the layers to each other.

[0031] Fig. 2 shows a preferred embodiment of grinding tool seen from the side. The basis plate 2 is connected to grip layers by means 6 binding the basis and the at least one grip layer together. The means 6 may be glue as mentioned above.

[0032] Further, the figure shows the grinding surface 4 attached to the basis layer 2 and the handling means 5 in the form of a handle or a stick attached to the grip layers 3.

[0033] Fig. 3 shows the layers of the preferred embodiment of fig. 2 separated from each other.

[0034] In the preferred embodiment, the grip layers 3 comprise three layers with the first and the second aluminum layers being separated by a layer of PVC, coal fibers or similar synthetic materials.

[0035] The thickness of the layer (C) of PVC, coal fiber or a similar synthetic material is between 1 and 20 millimeters, preferably between 2 and 5 millimeters. The thickness of the first and second aluminum layers (B, D) is between 0.1 and 5 millimeters, preferably between 0.2 and 0.5 millimeters.

[0036] The thickness of the basis layer (A) in the form of a steel plate is less than 2 millimeters and preferably between 0.1 and 1 millimeter, e.g. 0.5 millimeter.

[0037] Fig. 4 shows a further embodiment of a grinding tool according to the invention in which the two edges 7 of the steel plate 2 are bent downwards in relation to the grip layers 3. In the present embodiment, the bent edges have a length corresponding to the thickness of the grip layers 3 and thus protect and support the sides of the grip layers.

[0038] In a further embodiment the edges may be bent underneath the grip layers 3. Also, the number of edges bent may be changed if this is advantageous in the given situation.

List of reference number for the figures

[0039]

1. Grinding tool
2. Basis layer
3. Grip layers
4. Grinding surface
5. Gripping means such as a handle or a stick
6. Means for binding the basis and the at least one grip layer together
7. Edges bent downwards
8. Countersunk head of a screw or screw bolt
9. Screw hole
10. Screw or screw bolt

Claims

1. Grinding tool (1) for grinding a surface by hand, said tool comprising a composite layer structure including 5
 a basis layer (2) with a grinding surface (4),
 at least one grip layer (3) and
 means (6, 10) for connecting said metal and
 said at least one grip layer (3) together, and
 gripping means (5) for fastening onto said compos- 10
 ite layer structure.
2. Grinding tool according to claim 1, where said basis layer (2) is a steel plate. 15
3. Grinding tool according to claim 1 or 2, where said composite layer structure includes at least two different materials.
4. Grinding tool according to any of claims 1 to 3, 20
 where said grinding surface (4) includes hard metal grains fastened onto said basis plate (2) by soldering, brazing, welding, gluing or the like.
5. Grinding tool according to any of claims 1 to 4, 25
 where said basis plate includes one or more edges (7) bent downwards in relation to said at least one grip layer (3).
6. Grinding tool according to any of claims 1 to 5, 30
 where said at least one grip layer (3) is a plate of wood, plastic such as PVC or similar synthetic materials, coal fibers, a metal such as extruded aluminum with internal ribs or the like, or combinations of plates comprising wood, plastic, a metal such as ex- 35
 truded aluminum with internal ribs or the like.
7. Grinding tool according to claim 6, where said at least one grip layer (3) comprises a layer of PVC, coal fibers or a similar synthetic material between a 40
 first and a second aluminum layer.
8. Grinding tool according to claim 7, where the thickness of said layer of PVC, coal fiber or similar synthetic materials is between 1 and 20 millimeters, 45
 preferably between 2 and 5 millimeters, and where the thickness of said first and second aluminum layer is between 0.1 and 5 millimeters, preferably between 0.2 and 0.5 millimeters. 50
9. Grinding tool according to any of claims 1 to 8, 55
 where the thickness of said basis layer is less than 2 millimeters and preferably between 0.1 and 1 millimeter, e.g. 0.5 millimeter.
10. Grinding tool according to any of claims 1 to 9,
 where said gripping means (5) is a handle or a stick attached to said composite layer structure by fas-

tening means (10) such as rivets, nails, pins, screws, countersunk screws, screw bolts or the like by soldering, brazing, welding, gluing or the like.

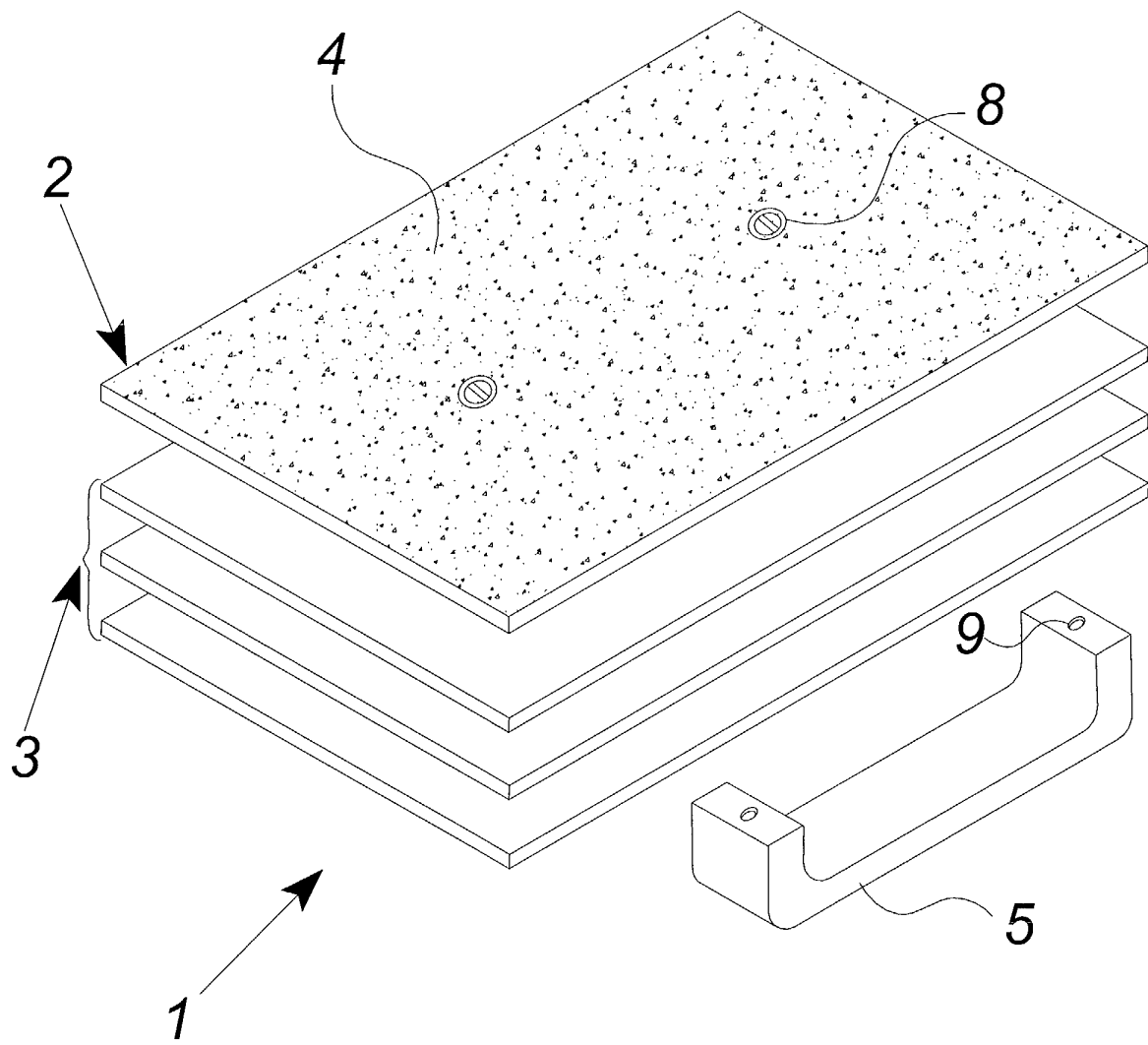


Fig. 1

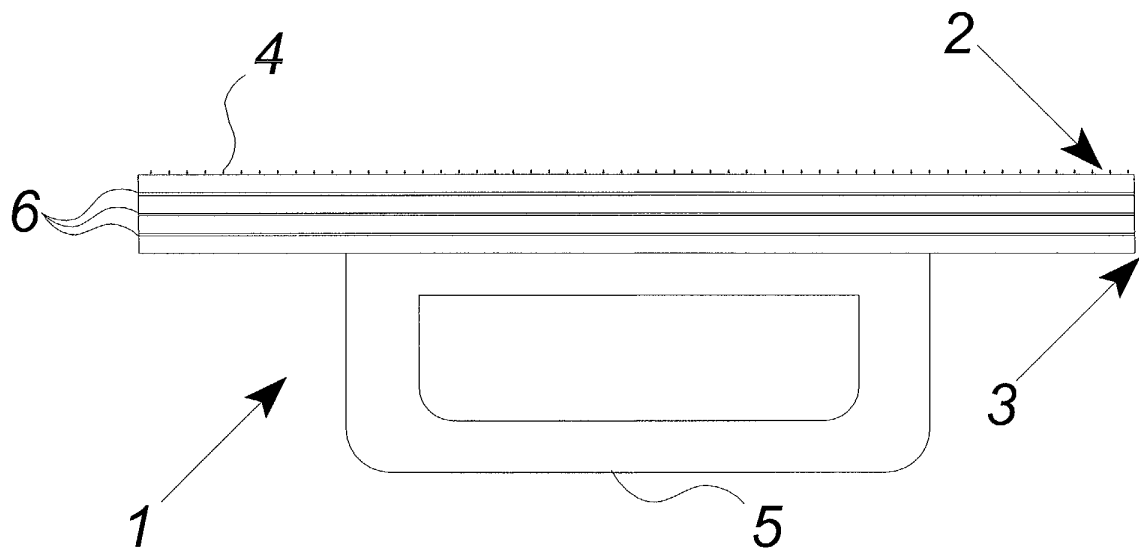


Fig. 2

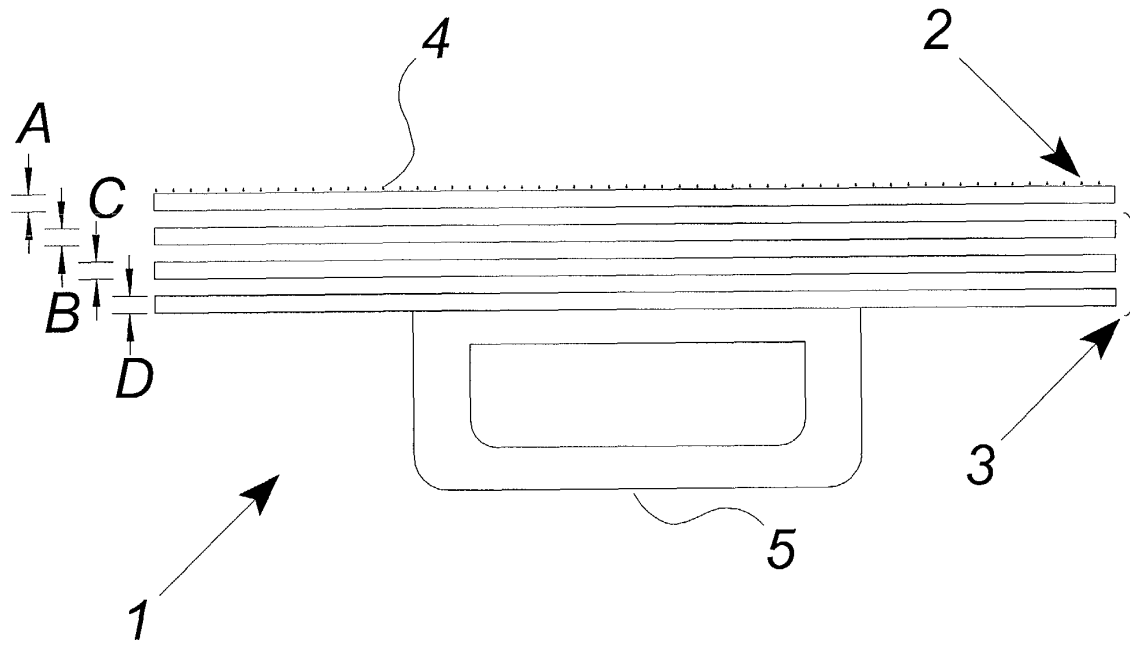


Fig. 3

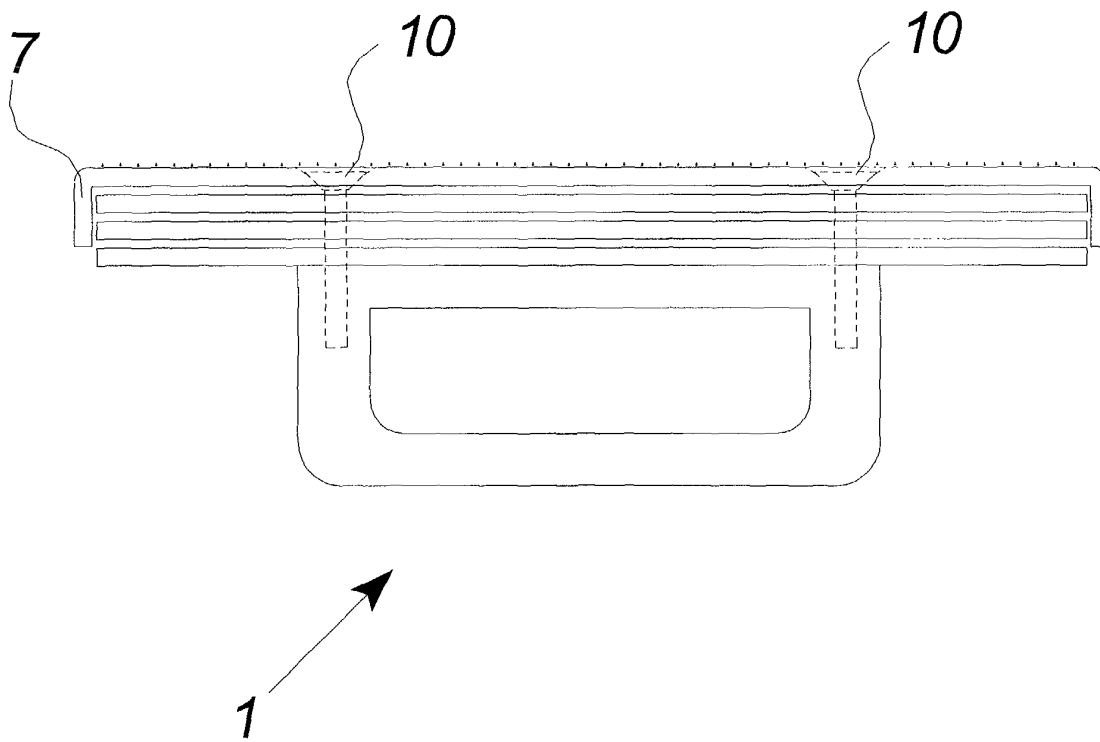


Fig. 4