

SPECIFICATION

Trueing tool

The present invention refers to a trueing tool.

The main functions of trueing tools for dressing
5 the working surfaces of grinding wheels are, the
removal of dulled abrasive material and metal
particles clogging the working surface of the
wheel, and restoration of the correct geometric
shape of the working surface. It has been known
10 for quite some time to use diamond tools as
trueing tools. Thus there are available diamond
single- and multi-grain trueing attachments,
diamond trueing blocks and diamond trueing
rollers. When using a trueing block the wheel is
15 lowered in small increments on each pass of the
block beneath the wheel. When using diamond
trueing rollers, there are rotated relative to the
rotating grinding wheel and separate drivers are
often used to rotate the trueing rollers in opposite
20 directions.

In the manufacture of diamond trueing rollers
there is a positive and a negative method. In the
positive method, diamond grain is bonded to an
accurately sized basic body by electrolytic metal
25 deposition. By this method diamond trueing rollers
can be manufactured with only limited accuracy.
In the negative method one obtains a better
dimensional accuracy. In this method diamonds
are placed by hand and bonded by electrolytic
30 metal deposition or with sintered metal to a ring
placed in a mould of which the inner surface of the
mould corresponds exactly to the outer surface of
the trueing roller to be formed. After removal of
the moulding ring, the trueing roller has an outer
35 contour which exactly corresponds to the desired
profile.

By using different diamond grain sizes and
manufacturing techniques as well as different
metallic or plastic bonds, one can make diverse
40 types of trueing rollers. These diamond trueing
rollers, with the exception of a few, are coated
with only one layer of diamond grains which cover
the total surface of the trueing roller, thus
presenting a sealed surface.

45 It is the object of the present invention to
provide a trueing tool that enables grinding wheels
to be dressed accurately and sharpens them to
increase their service life.

According to the present invention we provide
50 a trueing tool comprising a body of material in the
form of a disc or block having a plurality of profiled
plates made of hard or superhard material
arranged at predetermined distances one behind
the other about the periphery of said disc or along
55 one edge of said block so that on movement of the
disc or block relative to the surface of a grinding
wheel to be dressed the profiles of the plates
viewed in the direction of movement thereof
combine to form a profile complementary to that
60 of the required profile of the grinding wheel
surface.

The hard or superhard material is preferably
polycrystalline, synthetic diamond or cubic-
crystalline boron nitride or hard metal, e.g. in the

65 form of wolfram compounds or titanium
compounds or ceramics. In the embodiments of
the invention to be described hereinafter the
plates comprise a compact unit of hard or
superhard material, or of a body provided with a
70 coating of material having a predetermined profile.
If coated bodies are used as profiled plates, known
methods can be used as e.g. electrolytic coating or
sputtering, which are used for diamond or hard
metal or ceramic cutting material.

75 A distinctive feature of a disc shaped trueing
tool in accordance with this invention is the
provision of recesses around the periphery of the
tool dividing it up into segments the frontal
surfaces of which have located thereon the
80 profiled plates of hard or superhard material to
dress the surface of a grinding wheel, the material
removed from the grinding wheel then being
received in the recesses so that it is not carried
round with the tool to clog or inhibit the cutting
85 action of the trueing tool. Some of the plates may
comprise separate plate sections whose profiles
form a complimentary part of the profile of the
grinding wheel surface to be dressed. In this case
it is preferable to arrange the plate following a
90 plate having two or more plate sections behind the
gap between the sections so that no grooves or
ridges are formed on the grinding wheel surface.

When the trueing tool is in the form of a block,
95 the profiled plates are arranged linearly one
behind the other with recesses in front of the
plates, the arrangement of the recesses and plates
being the same as in the disc form of trueing tool
except that plates are arranged in a straight line
instead of in a circle.

100 In order to obtain desired profiles with available
polycrystalline, synthetic diamond plates that are
on the market in the form of circular wheels of a
thickness of 1,5 mm or 3,2 mm and a diameter of
13,7 mm, the plates are profiled by means of
105 spark erosion or by an electron or laser beam, or a
hot oxygen jet, or by grinding or shaping.

In the accompanying drawings:

Figure 1 is a side view of a trueing tool
according to the invention in the form of a trueing
disc or wheel,

110 Figure 2 is a top view of the trueing tool shown
in Figure 1,

Figure 3 is a side view of a trueing block, and

115 Figure 4 is a sectional view of the trueing block
shown in Figure 3.

A trueing wheel 10 shown in Figures 1 and 2
comprises a disc 12 having eight segments 14
between each of which is a chip recess 26, a hard
metal plate 16 being secured to the frontal surface
of each segment 14. On top of each plate 16 is
120 material 20 to support profiled plates 18 of
polycrystalline synthetic diamond or any other
suitable cutting material, the material 20 being
preferably hard metal. One or more plates 18 may
be fixed to the material 20 as shown in Figure 2
where two plates 18 are fixed to the same frontal
surface of one segment 14 whilst a single plate 18
125 is fixed to the frontal surface of the immediately
following segment and arranged behind the gap

between the two plates to avoid ridges or grooves being cut in a grinding wheel dressed by the wheel 10.

Although the profile of the plates 18 shown in Figure 2 are of simple arcuate form, the plates 18 may be cut to provide different profiles to match the profiles of particular grinding wheels which require dressing.

The plates may be cut to form desired profiles by spark erosion, by an electron or laser beam or a hot oxygen jet, or by grinding and shaping. By these means, a very accurate profile can be formed enabling the working surface of a grinding wheel to be dressed accurately and provide a high degree of sharpness thereby improving the service life of the wheel.

The chip recesses 26 receive worn out blunted grains removed from a grinding wheel as it is being dressed so that they are not carried round with the trueing tool as it is rotated as in conventional trueing rollers provided with continuous surfaces coated with diamond grains.

Figure 3 is a side view of a trueing block 30 having projections 32, on the leading edges of which cutting elements 34 are arranged. These cutting elements 34 are hard or superhard materials, consisting of a compact unit in the form of profiled plates or of bodies coated with a cutting material. The projections 32 can be an integral part of the body 28, or can be fixed thereon.

In the embodiment according to Figure 3 plates of polycrystalline, synthetic diamond are connected to the body 28 by means of a supporting material (which at the same time forms the projections). Like the trueing roller 10, the trueing block 28, is provided with chip recesses 36 in front of the projections.

Figure 4 is a front view of the trueing block 30 according to the invention showing that the profile surface of a projection is composed of several processed plates of hard or superhard material.

With the trueing roller as well as the trueing block according to the invention there is the further advantage that the profiled plates can be reprofiled and eventually replaced.

CLAIMS

1. A trueing tool comprising a body of material in the form of a disc or block having a plurality of profiled plates made of hard or superhard material arranged at predetermined distances one behind the other about the periphery of said disc or along one edge of said block so that on movement of the disc or block relative to the surface of a grinding wheel to be dressed the profiles of the plates viewed in the direction of movement thereof combine to form a profile complementary to that of the required profile of the grinding wheel surface.

2. A tool as claimed in Claim 1, wherein said plates are coated with diamond or synthetic diamond grains.

3. A tool as claimed in Claim 1 wherein said plates are integral with said body and coated with diamond or synthetic diamond grains.

4. A tool as claimed in any one of Claims 1 to 3, wherein said body in the form of a disc comprises a plurality of segments, the plates being located on the frontal surfaces of said segments and recesses being formed between said segments and in front of said plates when viewed in the direction of rotation of said disc.

5. A tool as claimed in any one of Claims 1 to 4, wherein one or more of said plates comprise separate plate sections, each section having a profile forming a complementary part of the required profile.

6. A tool as claimed in any one of the preceding claims, wherein said plates are made of, or coated with polycrystalline material.

7. A tool as claimed in any one of Claims 1 to 5, wherein said plates are made of, or coated with wolfram compounds or titanium compounds or ceramics.

8. A tool as claimed in any one of Claims 1 to 7, wherein said profiles have been formed by spark erosion, or electron or laser beams, or by a hot oxygen jet.

9. A trueing tool substantially as hereinbefore described with reference to Figures 1 and 2 or 3 and 4 of the accompanying drawings.



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