DISCLOSURE OF INVENTION

Embodiments of ~~The~~ the invention ~~pertains to~~seek to provide an outer blade cutting wheel comprising a base in the form of an annular thin disc of cemented carbide and a blade section formed on an outer periphery of the base, the blade section being an abrasive layer comprising abrasive grains and a metal or alloy bond for bonding the grains to each other and to the base. ~~An object~~Embodiments of the invention ~~is~~ also seek to provide a method for dressing the outer blade cutting wheel in a satisfactory and efficient manner so that the cutting wheel as dressed is ready for effective cutoff operation. ~~Another object is~~Embodiments of the invention further seek to provide a method for manufacturing such an outer blade cutting wheel using the dressing method.

In conjunction with an outer blade cutting wheel comprising a base in the form of an annular thin disc of cemented carbide and a blade section formed on an outer periphery of the base, the blade section being an abrasive layer comprising abrasive grains and a metal or alloy bond for bonding the grains to each other and to the base, the inventors have found that in dressing of the blade section of the outer blade cutting wheel, if part of the bond and chips received in chip pockets are dissolved away by electropolishing, then abrasive grains are effectively exposed and chip pockets are formed, achieving satisfactory truing.

Continuing further investigations on the efficient dressing of the blade section by electropolishing, the inventors have found that very efficient and consistent electropolishing ~~is~~ can be ensured by clamping the outer blade cutting wheel between a pair of circular jigs to hold the cutting wheel such that the opposed surfaces of the cutting wheel are covered over a predetermined range with the jigs and the blade section projects beyond the outer edge of the circular jigs, immersing the cutting wheel clamped between the jigs in an electropolishing liquid in an electropolishing tank, providing an electrode which is spaced apart from and encloses the outer circumference of the blade section and a pair of electrodes which are opposed to and spaced apart from the side surfaces

metal or alloy between abrasive grains and chips received in chip pockets in the blade section surface until abrasive grains are partially raised from the blade section surface.

In a preferred embodiment, the abrasive grains are diamond and/or CBN grains.

In a preferred embodiment, the bonding metal is selected from Ni and Cu, and the bonding alloy is selected from Ni-Fe, Ni-Mn, Ni-P, Ni-Co and Ni-Sn alloys.

The manufacturing method may comprise, after the step of electroplating or electroless plating to form an abrasive layer composed of abrasive grains and the metal or alloy, the step of effecting further electroplating or electroless plating to form a plating cover for enhancing the bond strength between abrasive grains and between abrasive grains and the base; or the step of infiltrating a molten metal and/or alloy into voids between abrasive grains or between abrasive grains and the base and solidifying the metal and/or alloy therein. Preferably the infiltrating metal is Sn and/or Pb, and the infiltrating alloy is selected from Sn-Ag-Cu, Sn-Ag, Sn-Cu, Sn-Zn and Sn-Pb alloys and mixtures thereof.

ADVANTAGEOUS EFFECTS OF INVENTION

The ~~inventive~~ disclosed method for dressing an outer blade cutting wheel comprising a cemented carbide base and a blade section composed of abrasive grains and a metal or alloy bond on the outer periphery of the base may ensure~~s~~ efficient and satisfactory dressing of the blade section. A high-performance outer blade cutting wheel can be manufactured in an efficient and consistent manner.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 schematically illustrates exemplary circular jigs used in the dressing method of the invention.

FIG. 2 schematically illustrates an outer blade cutting wheel held between the jigs, FIG. 2A showing an overall assembly, FIG. 2B showing an outer periphery portion