Oct. 23, 1934. E. OFFENBACHER 1,977,952

CUTTING AND GRINDING DISK

Filed May 31, 1933

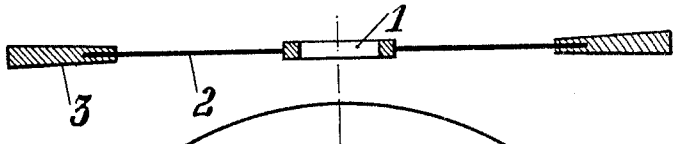

Fig. 1

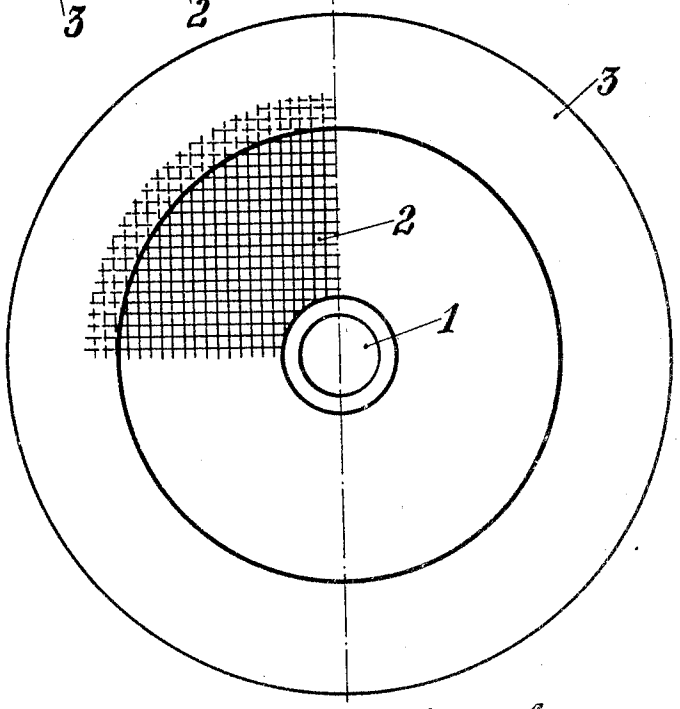

Fig. 2

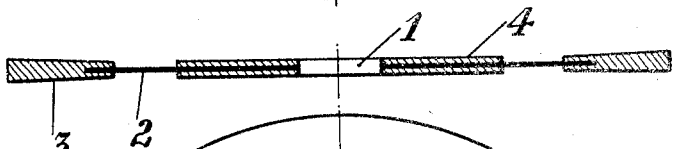

Fig. 3

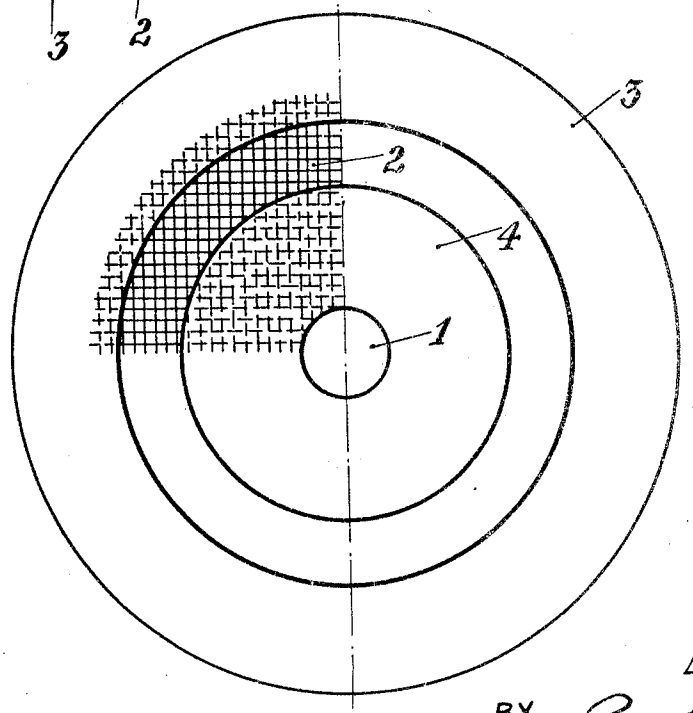

Fig. 4

Inventor:
Emil Offenbacher.
BY
Attorney:

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CUTTING AND GRINDING DISK

Emil Offenbacher, Nuremberg, Germany

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1 Claim. (Cl. 51—206)

The narrow grinding wheels or disks have been found specially useful for separating and removing hard matter such as metal, stone, etc. These cutting and grinding wheels are advantageously provided with a metal core, the edge of which is coated with the abrading material. The object of providing a metal core, generally constituted by high grade steel, having a high resistance to pressure, and under a thickness of 2 to 3 millimeters was to prevent the wheel from flying off, by the pressure involved during the working, between the securing cheeks, and to allow constructing comparatively large disks having up to 1500 millimeters diameter, as there was only a grinding ring of about 25 to 60 millimeters width to mount on the core. The ring projects about one or two millimeters on either side of the core, so that the cutting surface is about 6 to 12 millimeters thick.

These cutting and grinding wheels or disks work with a linear speed of about 30 to 40 meters per second. It is therefore necessary that the steel core be truly turned, faced and centered, and that the abrading coating be carefully compressed on the core, or it would be impossible to avoid producing irregular work, defective cutting, a great loss of power by wedging, and finally breaking of the coating by the high pressures of work involved. Even with a careful manufacture the lateral and inevitable deviation of the rigid system of the grinding wheel will produce, in the work-piece, a cut some 2 or 3 millimeters wider than the width of the tool, therefore some 8 to 15 millimeters wide.

All these defects are avoided by the present invention, which consists in that the metal core of the disk or wheel, coated at the periphery thereof with an abrading material, is formed of a material which, while being quite firm in a lateral direction, possesses resiliency in the cutting plane. Such a metal core will be preferably formed of a wire tissue or net, on which the abrading material may be easily mounted. The resiliency sought in the plane of the disk or wheel allows the play of the stresses developed in the rotation of the disk. Practice has proved that these wire tissues or nettings do not allow lateral deformation, due to the very high speed reaching a linear speed of 90 meters per second officially allowed, which produces an additional tensioning and centering of the wire core.

The cutting wheels used heretofore, with steel core, are comparatively costly on account of their difficult manufacture. But the disks with a wire core according to this invention are much cheaper because they involve only a small portion of the value of the steel used for the other wheels. Although they are cheaper, the disks according to this invention are more efficient as has been proved by practical experiments, because the abrading bodies are better utilized on account of the resilient mounting thereof and because the water is better distributed by the meshes in the netting.

The invention therefore brings forth, not only a technical progress, but a decrease in the manufacturing cost of a tool used by hundreds of thousands.

If it is not possible, for a very large diameter of disk or wheel, to use a wire netting or tissue of too great a thickness, on account of the too wide cutting line which would be a consequence, one can, according to a second form of realization, coat the abrading matter over a portion of the tissue, this coating being made from the inside to the outside, and the said abrading matter being placed by means of pressure, simultaneously with the external working edge. In this manner, only that portion of the core which is connected to the abrading edge, remains as free netting and keeps the necessary resiliency whilst the internal portion remains absolutely rigid, the netting being therein embedded in the abrading material. This realization allows to make smaller and thinner securing cheeks and allows to cut in the work-piece deeper for a given diameter.

Two forms of realization have been illustrated in the appended drawing, in which Figs. 1 and 2 are respectively a section through a diameter and a side view of a first form, and Figs. 3 and 4 are similar views of a second form.

In Figs. 1 and 2, reference numeral 2 designates the wire netting or tissue, 1 the central axis of mounting of the disk and for the securing cheeks, which are not illustrated, and 3 is the rim of abrading material.

In Figs. 3 and 4, the same reference numerals indicate the same parts, 4 being also the portion of the wire netting or tissue covered on both sides, or embedded in the abrading material, the wire being free only in 2, between the rim portion 3 and the internal portion 4.

Having now fully described my said invention, what I claim and desire to secure by Letters Patent, is:

A cutting disk including a core formed of wire gauze, the core being coated at its central portion with material to form a hub, abrading material coating the core at its peripheral edge portion to provide a cutting area, the wire gauze forming the sole connection between the hub and the cutting edge material and providing an annular otherwise free cutting area.

EMIL OFFENBACHER.