No. 794,496. PATENTED JULY 11, 1905.

G. GORTON.

ABRADING SHEET.

APPLICATION FILED MAY 23, 1902. RENEWED DEC. 13, 1904.

Fig. 1.

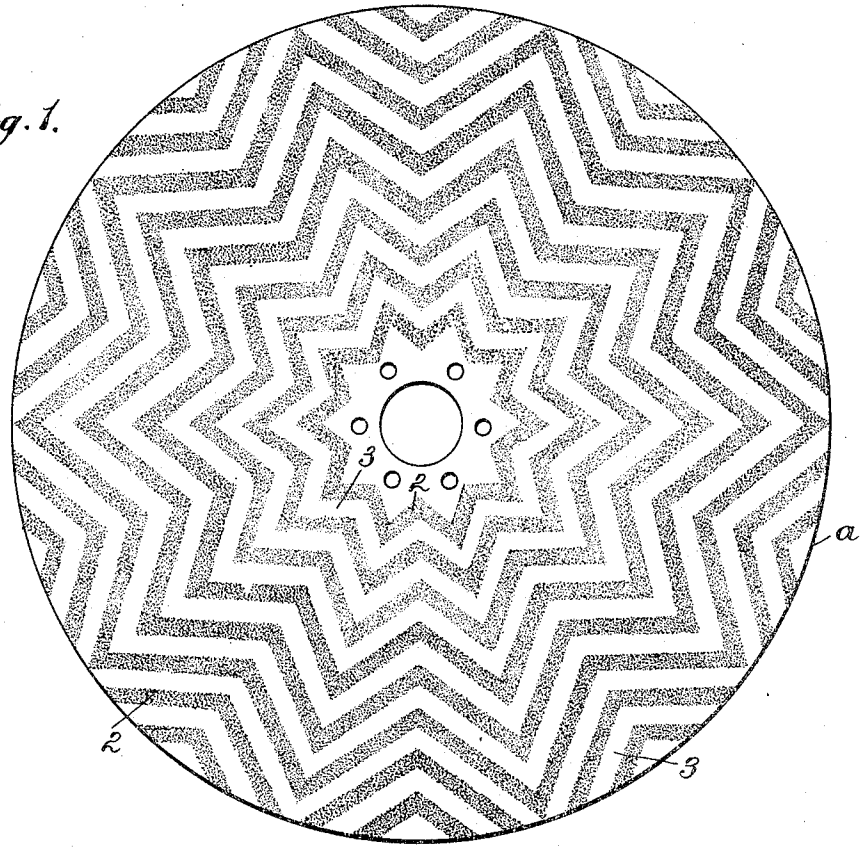


Fig. 2.

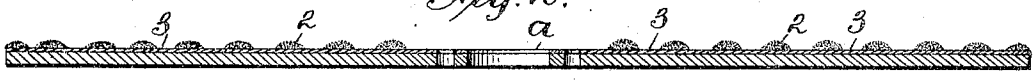
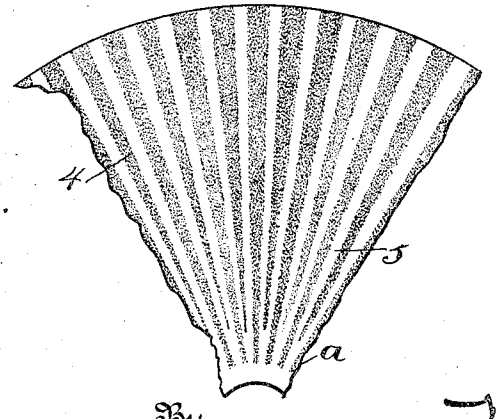


Fig. 3.



Witnesses

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No. 794,496. Patented July 11, 1905.

UNITED STATES PATENT OFFICE.

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ABRADING-SHEET.

SPECIFICATION forming part of Letters Patent No. 794,496, dated July 11, 1905.

Application filed May 23, 1902. Renewed December 13, 1904. Serial No. 236,759.

To all whom it may concern:

Be it known that I, GEORGE GORTON, a citizen of the United States, residing at Racine, Racine county, Wisconsin, have invented certain new and useful Improvements in Abrading-Sheets; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain improvements in abrading-surfaces.

An object of the invention is to provide an abrading-surface having the abrading material so arranged thereon in lines or ribs that intervening blank or clearance spaces are formed between the ribs or lines of abrading material and approximately transverse of or at an angle to the lines of movement of the surface when at work.

Another object of the invention is to provide an improved abrading-surface having lines or ribs of abrading material and intervening lines of blank or clearance spaces which so intercept the lines in which the grit and refuse travel as to provide for rapid clearance of said surface, and hence thereby reduce heating of the work and gumming of the abrading-surface to the minimum, while increasing the grinding speed and working life of the abrading-surface to the maximum.

The invention consists in forming the abrading material on the backing sheet or carrier in a multiplicity of closely-arranged raised ribs or lines separated to form intervening blank or clearance spaces intercepting the lines in which the grit or refuse travels across the face of the work or on lines, in other words, approximately transverse of the path of movement of said abrading-surface while at work.

In the accompanying drawings, which show arrangements merely as examples among other arrangements and constructions within the spirit and scope of my invention, Figure 1 is a plan view of a circular abrading-disk having its abrading-surface formed in accordance with my invention. Fig. 2 is a section thereof. Fig. 3 is a plan view of part of a circular disk having a somewhat different arrangement of abrading-surface.

In the drawings, *a* is a suitable backing or carrier for the abrading-surface. In the present showing this carrier consists of a flat flexible sheet of paper, cloth, or other suitable fabric having the abrading material on one side thereof. Such abrading-sheets can be used in various connections and for various purposes—for instance, for grinding-drums, endless grinding-bands, flat disks, &c. I show a circular paper or fabric abrading-disk particularly adapted for cementing against the flat plane face of the rotary metal disk, carrying-head, or plate of a flat or curved surface grinding-machine. These heads are rapidly rotated, and a work-holder is provided opposite the abrading-surface thereof, so that the material (work) to be ground, polished, or finished can be held to the rapidly-rotating abrading-surface. The grit and refuse rubbed from the work and from the abrading-face follow or move on lines concentric with the axis of the rapidly-rotated disk during the abrading operation, and unless some properly-arranged outlet, relief, or clearance is provided the said grit or refuse will rub completely across the face of the work and between the same and the abrading material and cause undue heating of the work, excessive wear and gumming of the abrading material, and greatly retard and reduce the speed of the grinding operation by preventing the desired intimate grinding contact between the abrading material and the work. I provide the necessary clearance or relief for the grit and refuse by dividing up the abrading-surface into working ridges, ribs, or raised lines, with intervening clearance-spaces radially intersecting at an angle to or transverse of the circle, plane, or line of movement of the abrading-surface when in operation. In other words, I provide closely-arranged clearance-spaces which will successively sweep across the work immediately between abrading or working ribs or lines sweeping across said work, and thereby avoid unbroken concentric lines of abrading material without transverse or radial clearance-spaces. For instance, in Figs. 1 and 2 the abrading-surface is built up by a multiplicity of ribs, ridges, or raised lines 2, of abrading material, generally arranged concentrically of the

disk; but each line is so formed corrugated, zigzag, waving, or undulating in outline as to be made up of approximately radial portions or portions approximately transverse to the direction of movement of the abrading-surface across the work. These waving or corrugated lines of abrading material are shown separated from each other by intervening and correspondingly-shaped blank or uncovered spaces 3, forming clearance-spaces, and so that the abrading-surface will in operation completely cover the face of the work being ground and will reduce the same evenly without leaving grooves or depressions therein or ridges thereon.

In Fig. 3 another arrangement is shown, wherein the lines 4 of abrading material are radially arranged, forming the radial clearance-spaces 5, so that each line of abrading material will sweep transversely across the work and will have a radial clearance-space behind it into which the grit and refuse can drop and from which it can easily fly centrifugally. Many other arrangements of lines of abrading material with intervening clearance-spaces can be provided to avoid the disadvantages of an unbroken abrading-surface and of an abrading-surface with a continuous line of abrading material running in the direction of movement of the surface, in which event the refuse rubs completely across the work and between the same and said line. By providing the raised lines of abrading material arranged on lines intercepting transverse of or at an angle to the direction of movement of the abrading-surface it is not necessary for the refuse to rub completely across the face of the work; but the refuse from each transverse working rib as it sweeps across the work drops into the transverse clearance-space behind such rib, and each clearance-space takes care of the refuse from the working rib immediately in advance, leaving no refuse to rub between the succeeding working rib and the work being reduced.

These abrading-sheets are usually manufactured by applying lines of glue to the sheet, so that the lines of glue conform to the lines of abrading material desired on the completed sheet. Any suitable abrading material in the form of grit of the desired degree of fineness is then scattered on the sheet and is taken up by the glue, so that when the glue sets the abrading-sheet is formed with the blank or uncovered portions and the rounded or convexed ribs or ridges of grit.

The abrading-sheets can be formed circular or in long sheets, which can be rolled and afterward cut into circular forms or used in endless bands or placed on drums.

It is evident that various other arrangements of the lines of abrading material and clearance-spaces can be employed, and I do not wish to limit myself to the exact construction shown, but consider myself entitled to all such modifications as fall within the spirit and scope of my invention.

Having thus fully described my invention, what I claim is—

1. As an article of manufacture, a backing having an abrading-surface composed of a multiplicity of separated closely-arranged projecting ridges or ribs of abrading material and intervening blank or uncovered portions parallel with said ribs and forming the clearance-spaces, said ribs being arranged at an angle to the direction of movement of the surface across the work, substantially as described.

2. As an article of manufacture, a sheet having its working face formed by a multiplicity of approximately-concentric zigzag ribs of abrading material, said ribs being separated by the blank or uncovered portions of the sheet to form the zigzag clearance-spaces, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE GORTON.

Witnesses:

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