

(No Model.)

A. V. RINGSTRÖM.

GRINDING, ABRADING, OR CUTTING MATERIAL AND MODE OF
PREPARING SAME.

No. 604,569.

Patented May 24, 1898.

Fig: 1.

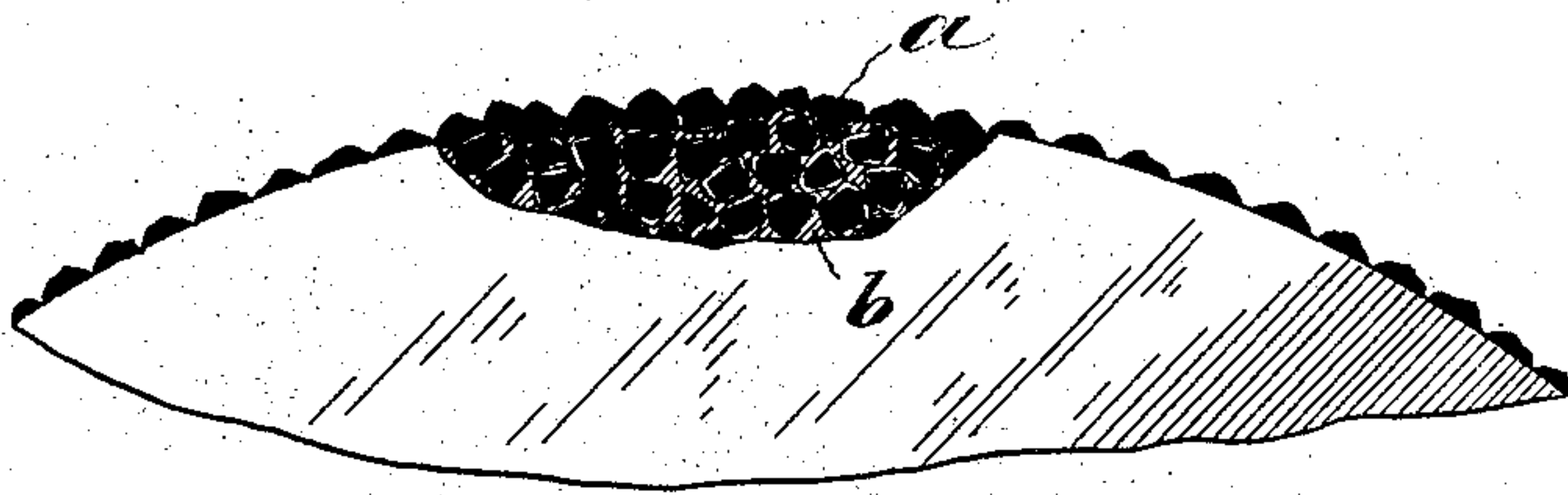
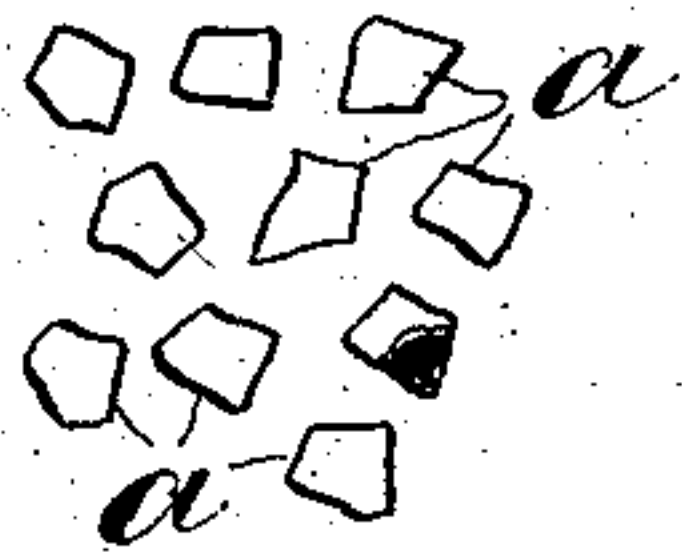


Fig: 2.



WITNESSES:

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AUGUST VILHELM RINGSTRÖM, OF ÖREBRO, SWEDEN, ASSIGNOR TO NILS EYVIN FRYKHOLM, OF STOCKHOLM, SWEDEN.

GRINDING, ABRADING, OR CUTTING MATERIAL AND MODE OF PREPARING SAME.

SPECIFICATION forming part of Letters Patent No. 604,569, dated May 24, 1898.

Application filed December 26, 1895. Serial No. 573,393. (No model.)

To all whom it may concern:

Be it known that I, AUGUST VILHELM RINGSTRÖM, a subject of the King of Sweden and Norway, and a resident of 34 Storgatan, Örebro, in the Kingdom of Sweden, have invented certain new and useful Improvements in Grinding, Abrading, or Cutting Materials and in the Mode of Preparing the Same, of which the following is a specification.

10 This invention relates to the class of compositions for grinding, abrading, cutting, or polishing wherein the abrading material in bits or pieces is united in a mass of the proper form by means of metal used as a binding agent. Heretofore, so far as I am aware, this mode has been applied only in making millstones, where relatively large bits or pieces of emery have been united or joined in a mass by simply pouring over or among them 20 metal—as zinc, for example—which has a comparatively low melting-point. My invention does not employ the abrading material in coarse bits or pieces, but in fine particles, like sand, and it has been found impracticable 25 with a mass of such fine material to unite all of the particles to each other with molten metal by simply mixing the latter with the particles of abrading material. To overcome this difficulty and to provide a cutting or 30 abrading surface on the article or tool is the object of the present invention, which consists, essentially, in first coating each particle or grain of the abrading material with metal, then mixing the coated particles with molten 35 metal or metallic alloy, and then casting the mass to give it the proper form.

In carrying out the invention I take fine particles of the abrading material—such as diamond-dust, corundum, carborundum, emery, 40 &c.—and give to each particle or granule of such material a metallic coating. This coating may be applied in several ways. For example, the abrading material may be placed in a suitable solution of a metallic salt, to 45 which a reducing agent is added—for instance, a solution of oxid of silver in ammonia, to which is added a reducing agent, as grape-sugar, tartaric acid, &c.—or a coating of metal may be applied mechanically—for 50 example, by first coating the particles or granules of the abrading material with some

refractory adhesive substance (as “water-glass,” so called) and then coating the particles with powdered metal or metal-dust, which latter is caused to adhere to the particles by the water-glass. This may be effected by putting the particles of abrading material in a mixing-drum with a sufficient quantity of the water-glass to cover them, then adding to the mass a sufficient quantity of 60 the metal-dust, and then shaking or agitating the mass until the particles are all thoroughly coated. The metallic coating, however applied, will be a mere film, very thin; but it will have sufficient strength to answer the purposes intended if the metal used for binding or connecting the particles in forming the tool or article has a lower melting-point than the coating metal and does not readily alloy with the latter. Otherwise the coating or film of 70 metal on the particles must be strengthened by applying a thicker coating, according to the well-known electroplating process or by electroplating alone, in which case the particles or granules of abrading material will 75 be first coated with graphite, manganese peroxid, &c., in lieu of metallic dust. This electroplating may be conveniently effected by first covering the particles of abrading material with a conducting coating or film, as 80 explained, and then immersing them in a suitable metallic-salt bath—for instance, an alkaline copper-salt bath—wherein they are allowed to come in contact with the electropositive metal, as zinc. This will give them 85 a coating of copper. The coated particles are now mixed with the molten metal or alloy, which is to embed them and bind them together. Such metal or alloy may consist of a suitable metal and sulfur, phosphorus, carbon, silicon, or other metalloid. As regards 90 the form of the abrading tool or article, the composition may be cast into the form of disks of different sizes and shapes or be cast on the surfaces of wires or ropes, such as endless 95 ropes for use in cutting stone, &c. It can also be cast on cloth and on the edges of thin metal plates to be used as saw-blades. After the compound has been cast the points or cutting edges of the particles of abrading material are exposed or denuded by removing 100 the metal covering them along the cutting-

10 this may be done
 away the metal with
 with water or oil, but pref-
 dissolving the metal away with
 corrosive chemicals; or if the bind-
 metal be an electropositive one, as zinc,
 denudation of the particles may be af-
 fected by galvanism in a well-known manner.
 The tool may be sharpened from time to time
 15 by this same mode of denudation of the angles
 or edges of the particles of cutting or abrad-
 ing material.

In the accompanying drawings, which illus-
 trate the invention, Figure 1 is an enlarged
 15 or magnified fragmentary view of a part of a
 tool constructed according to my invention;
 and Fig. 2 is a view on a similar scale, show-
 ing some of the metal-coated particles or
 granules before being bound together by the
 20 embedding metal.

In the views, *a* represents the coated gran-
 ules of abrading material, and *b* the binding
 or imbedding metal.

Having thus described my invention, I
 25 claim—

1. The herein-described method of prepar-
 ing abrading materials which consists in first
 applying to the separate, fine grains of a hard,
 abrading material, as corundum, a coating of
 metal, then mixing said coated grains with
 molten metal, and then shaping said mixture
 into suitable forms for use.

2. As an improved article of manufacture,
 an abrading or cutting tool having its surface
 composed of a mass of fine particles or gran-
 ules of hard abrading material, each coated
 with a film or metal, and an embedding or
 binding metal about and among said gran-
 ules, the binding metal having a lower melt-
 ing-point than that of the metal with which
 the granules are coated, substantially as set
 forth.

In witness whereof I have hereunto signed
 my name in the presence of two subscribing
 witnesses.

AUGUST VILHELM RINGSTRÖM.

Witnesses:

ERNST SVANGVIST,
 CARL TH. SUNDHOLM.