March 18, 1930. S. D. LAYTON 1,751,340

METHOD OF PRODUCING STEEL ABRASIVE MATERIAL

Filed Nov. 4, 1927

Fig. 1.

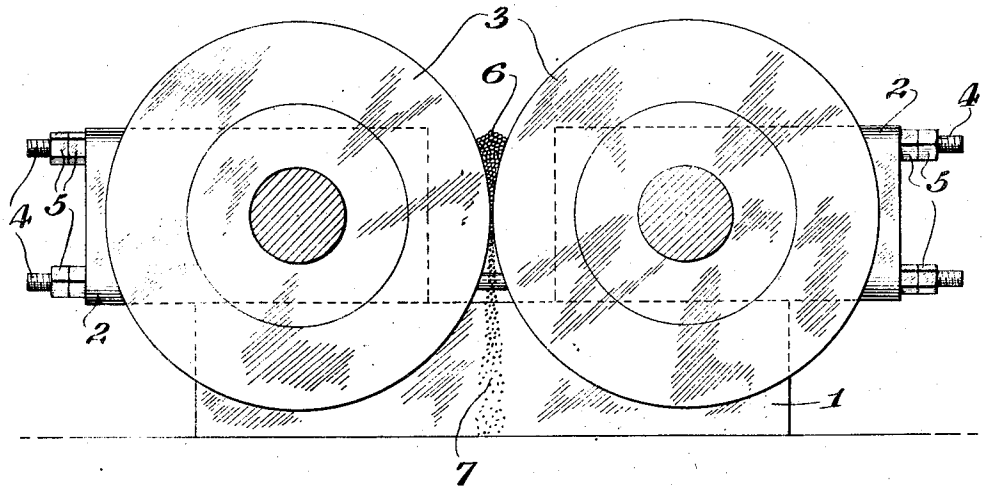


Fig. 2.

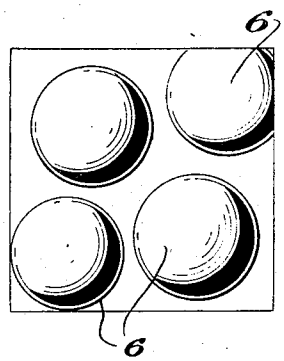
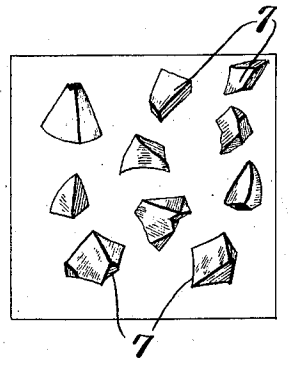


Fig. 3.



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METHOD OF PRODUCING STEEL ABRASIVE MATERIAL

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This invention relates to improvements in the production of carbonaceous metal abrasive material, the invention residing primarily in a method for the production of an abrasive matter from the so-called metal shot or similar stuff by passing the same between relatively adjusted rigidly supported rolls and thereby subjecting the matter to a crusher sufficient to reduce it to granular form, the granules of which will be of a more uniform size, yet relatively different shapes and cutting edges, affording the finished material with abrasive qualities capable of peak efficiency when directed on to an object to be treated thereby.

Another equally important object of the invention resides in the provision of a method for the production of a carbonaceous metal abrasive wherein a materially less number of differently sized abrasive granules will be produced, avoiding wastage and incident loss, the product being free from powder like particles and consequently, without graphite which, with usage of an abrasive containing the same will cause the objectionable smudging of objects treated therewith.

Other objects of the invention will be quite obvious and in part pointed out hereinafter.

That the meritorious features of the improved method hereinafter set forth in detail may be understood and appreciated by workers skilled in the art, it may be noted at this point that the methods heretofore practiced in the production of carbonaceous metal abrasive materials, generally, are objectionable and comparatively impractical in that through the same, a material consisting of too varied range of sizing is had, such material including granules of excessive size at the one extreme and particles of powder like character at the other. Because of this wide variance of sizes or mesh of the material, a goodly portion thereof represents absolute waste and loss following a classifying sizing of the same through separator apparatus. Further, by reason of the manner in which the shot or raw material is crushed, the graphite products of the metal are liberated and this, with a continued working of the method, causes the coating of the material to such an extent that the cutting edges of the granules or particles are rounded and dulled and when it is subsequently used an impractical cleaning results; also, with usage an extremely objectionable smudging of the article treated results, therefore rendering the material practically unfit for usage in the cleaning of porcelain matter and the like. The abrasive material produced by my improved method, as hereinbefore stated, contains but a limited number of differently sized granules and practically all of these granules may be classified or sized through suitable separator apparatus and subsequently used for different work; the particles or granules being free of graphite coating and consequently, possessing sharp or acute cutting edges capable of highly efficient abrasive action and further, the material is free of liberated graphite so that articles treated thereby will not be smudged or soiled.

In order that the invention and its mode of working may be fully understood by those skilled in the art, I have in the accompanying illustrative drawings and in the detailed following description based thereupon, set out a possible embodiment of the invention.

In the drawings:

Figure 1 is a vertical transverse section through a form of mill employed for the crushing of the abrasive material in accordance with the invention,

Figure 2 is a greatly enlarged elevation of the shot or raw material, from which I produce my improved abrasive, and

Figure 3 is a similar view showing particles or granules of abrasive material produced in accordance with the improved method.

Having more particular reference to the drawings, in connection with which like characters of reference will designate corresponding parts throughout, my improved method for the production of a carbonaceous metal abrasive material is effected or worked through the medium of a roll type of crushing mill such as is generally illustrated in Figure 1 of the accompanying drawings, said mill including a base or body portion 1 on which bearings 2 are adjustably mounted and

carry relatively opposed parallel crushing rolls 3 adapted to be rotated at substantially the same rate of speed; the bearings 2 being adapted to be relatively adjusted through the medium of adjusting rods 4 having adjusting and locking nuts 5 turned into engagement with the screw threaded ends thereof. By this means, the adjacent peripheral portions of the crushing rolls 3 may be minutely adjusted to such relative arrangement that the so-called metal shot or raw material designated by the numeral 6 and shown in detail in Figure 2, when introduced to and passed into the pre-adjusted gap between the curved crushing surfaces of the same, as shown in the Figure 1, will be reduced or crushed to produce abrasive granules of a generally uniform or near uniform sizing designated by the numerals 7 and shown in detail in the Figure 3.

It is of course to be understood that an appropriate form of means for feeding or delivering the raw material or metal shot through the relatively opposed peripheral portions of the crushing rolls, may be provided, such as conditions or preference may dictate and likewise, that a suitable form of means may be provided the mill for receiving the crushed abrasive material 7 and conveying it to a suitable delivery point. Likewise, if desirable, the specific form of crushing rolls and mounting therefor together with the mechanical means for effecting relative adjustment of the same may be changed or modified within the range of mechanical constructions that will permit of the relative movement or adjustment of the rolls and the positioning of the same in absolute parallelism.

As shown in the Figure 3 of the accompanying drawings, a carbonaceous metal abrasive material produced in accordance with my improved method will include granules 7 of generally uniform sizes and of a wide range of different shapes, the differently shaped granules each including a multiplicity of cutting faces or edges which will remain clean, sharp and acute and hence, will lend materially to the abrasive efficiency of the product. Furthermore, it will be understood that the abrasive material produced in accordance with the improved method will be free of graphite coating over or about the abrasive granules and consequently upon this, their cutting edges or faces of the granules will remain sharp and clean and therefore will effectively clean matter treated thereby without liability of smudging or similarly soiling it due to the coating of the granules by graphite liberated during the crushing operation as is the case with those forms of abrasive materials produced by method heretofore prevalent in this particular art.

The crushed carbonaceous metal abrasive subsequently to discharge from the mill will, of course, be subjected to a classifying stage of operation, not shown herein, whereby the differently sized granules will be classified according to their respective sizes and then packaged or bagged for subsequent usage in accordance with the requirements of a particular job.

As stated elsewhere in this specification, I am quite fully aware that carbonaceous metal abrasive materials have been long produced in this particular art but in so far as my knowledge extends, the art has heretofore been without a method of producing a carbonaceous metal abrasive material wherein a limited number of differently sized abrasive granules will be produced and wherein the presence of powder like particles in the material will be greatly reduced and furthermore, the abrasive granules or particles will be free of a coating of graphite liberated during the crushing operation. Through the medium of my method, an abrasive material possessing each of the aforesaid desirable qualities is had.

I claim:

1. The herein described method of producing a carbonaceous metal abrasive material, which consists in introducing the raw material in form of shot into the gap between relatively opposed crushing surfaces moving at substantially the same rate of speed through said gap and subjecting the material to the crushing action thereof.

2. The herein described method of producing a carbonaceous metal abrasive material which consists in introducing the raw material in form of shot into the preadjusted gap between relatively opposed crushing surfaces moving at substantially the same rate of speed through said gap and subjecting the material to the crushing action thereof.

3. The herein described method of producing a carbonaceous metal abrasive material, which consists in introducing the raw material in form of shot into the gap between the curved surfaces of relatively opposed crushing devices moving at substantially the same rate of speed through said gap and subjecting the material to the crushing action thereof.

4. The herein described method of producing a carbonaceous metal abrasive material, which consists in introducing the raw material in form of shot into the preadjusted gap between relatively opposed curved crushing surfaces moving at substantially the same rate of speed through said gap and subjecting the material to the crushing action thereof.

5. The herein described method of producing a carbonaceous metal abrasive material, which consists in introducing the raw material in form of shot into the gap between relatively opposed crushing surfaces

formed of material harder than said raw material and moving at substantially the same rate of speed through said gap and subjecting the material to the crushing action thereof.

6. The herein described method of producing a carbonaceous metal abrasive material, which consists in introducing the raw material in form of shot into the gap between relatively opposed crushing rolls moving at substantially the same rate of speed through said gap and subjecting the material to the crushing action thereof.

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