

UNITED STATES PATENT OFFICE.

CHARLES MARIA PIELSTICKER, OF LONDON, ENGLAND, ASSIGNOR TO THE
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MANUFACTURE OF SUBSTITUTE FOR EMERY-WHEELS.

SPECIFICATION forming part of Letters Patent No. 621,702, dated March 21, 1899.

Application filed August 9, 1898. Serial No. 688,198. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES MARIA PIELSTICKER, mining engineer, of London, England, have invented certain new and useful
5 Improvements in the Manufacture of a Substitute for Emery-Wheels, of which the following is a specification.

My invention relates to improvements in the manufacture of a substitute for emery-wheels; and the object of the invention is to
10 produce a substitute suitable for a wheel to be utilized for abrasive and polishing purposes which will be sufficiently hard so as not to wear down too rapidly; and it consists in the process hereinafter more particularly explained.

Heretofore I used to mix iron-sand, which is magnetic iron ore reduced by natural agencies, such as water or frost, with a binding
20 material and form a mixture in a mold under pressure and heat into a wheel in a similar manner as ground emery is formed into wheels for abrasive and polishing purposes. It has been found that although such wheels
25 worked well and were very useful for many purposes, yet for others they were not sufficiently hard and wore down too rapidly. My improvement results in removing this defect and rendering the wheels a great deal harder
30 and more durable. For this purpose I place iron-sand after the removal of silica or other extraneous matters into a crucible, together with a quantity of pulverized carbonaceous matter sufficient to reduce the iron-sand to
35 the metallic state. I also preferably add to the mixture of iron-sand and carbon a substance yielding phosphorus to the iron, such as bone-ash, of which about three per cent. is added, which has a tendency to render the
40 iron harder. After covering the crucible I heat the same in a furnace until the iron-sand is reduced to the metallic state. I then empty the red-hot or fused contents of the crucible into cold water, on the top of which lies a thick
45 layer of oil, the object of the latter being to coat the red-hot particles of iron with oil before they reach the water, which latter would otherwise reoxidize the finely-divided iron. Experiments by me show that when the mixture, compounded and heated as described,
50 is poured into a cold liquid, as stated, it will separate into particles. It must be further borne in mind that it does not require a temperature to fuse iron-sand in the presence of

carbon and absence of air into a molten mass, 55 but that a bright-red heat, which will not melt iron, is sufficient to reduce oxid of iron in the shape of iron-sand to the metallic state, leaving the product in the shape of finely-divided particles, as it originally was. The
60 product is then mixed with a binding material, such as vulcanized rubber, and formed in a mold under heat and pressure into the shape of a wheel which is of great hardness and serves for many purposes for which the much
65 more expensive emery-wheels are now used. Instead of rubber as a binding material to accomplish the molding of the wheel I would alternatively mix the product first with silicate of soda and next with a solution of chlorid of calcium. By the reaction produced I
70 would form a silicate of calcium, a binding medium of great strength and hardness. The chlorid of sodium produced by the reaction may be removed by immersing the wheel in
75 water.

Should it not be desired to form the product into a wheel, such material before or after being reduced to the metallic state, as
hereinbefore described, may be pulverized to
80 a greater degree of fineness by passing it between iron rolls or in any other suitable manner. When thus pulverized, the powder may be utilized as such or may be suitably spread
85 on cloth to be used the same as emery-cloth or on paper for analogous use, as may be desired.

What I claim as my invention is—

1. In the manufacture of a substitute for emery products the process herein described
90 consisting in purifying the iron-sand, heating the purified iron-sand in the presence of carbon to redness, and then immersing the red-hot iron particles in cold water, on the top of which rests a thick layer of oil as set forth. 95

2. In the manufacture of a substitute for emery, the process herein described, consisting in purifying the iron-sand, mixing in a crucible, the purified iron-sand and pulverized carbonaceous matter to reduce the iron
100 ore, and adding thereto a phosphorus yielding substance to harden the iron, heating the same, and then immersing the iron particles in a cold liquid, substantially as described.

CHARLES MARIA PIELSTICKER.

Witnesses:

H. T. S. YOUNG,
C. W. STUART.

