

UNITED STATES PATENT OFFICE.

JOHN DEAN, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-FOURTH TO GEORGE H. KINGSLEY, OF SAME PLACE.

MATERIAL FOR CLEANING AND POLISHING METALS.

SPECIFICATION forming part of Letters Patent No. 389,552, dated September 18, 1888.

Application filed September 5, 1887. Serial No. 248,864. (No specimens.)

To all whom it may concern:

Be it known that I, JOHN DEAN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have
5 invented certain new and useful Improvements in Materials for Cleaning and Polishing Metals; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the
10 art to which it appertains to make and use the same.

The invention has reference to a new combination of materials to be employed in rumbles or tumblers for cleaning and polishing
15 metal. Heretofore various methods and combinations of materials have been employed in this art for cleaning and polishing castings and other metals, and with varying results, according to the methods adopted and the character
20 and form of the metals treated. In some instances only the metals themselves were placed in the tumbling box or cylinder without the addition of other material, and mutual attrition was relied on to cleanse and smooth the
25 metal surface, or to these were added sand, slag, cinders, graphite, sawdust, scraps of leather, charcoal, or the like, usually one or the other alone, according to the article under treatment or the character of the work to be
30 done. It was also common to employ with these materials small sharp-pointed objects known as "tumbling stars," which were made of hard metal and served with their pointed ends to penetrate crevices and openings which
35 were inaccessible to ordinary surface action and to cleanse parts that could not otherwise be reached. In lieu of these, nails and like small metallic articles of irregular shape and sharp corners and points were used in connection with one or more of the polishing materials above named. With the exception of
40 some slight variations, this may be said to have been the state of the art, and represents the best-known methods therein prior to my invention; but the tumbling-star or its ordinary hard-metal substitute, when used with any of the known scouring substances, is liable to at least two material objections, which it is the purpose of my invention to remedy: first, owing
50 to the fact that it is both hard and sharp,

it is impossible to obtain a finished surface that is not more or less punctured, scratched, or otherwise defaced, especially if the softer metals are being handled; secondly, it is impossible by this method to carry the cleansing
55 and polishing process effectually into the interstices, recesses, or openings that usually appear in metals brought to the tumbling-box for treatment. The sharp-pronged star or spider was designed to remedy this defect in
60 the polishing process and to enter the recesses and openings for the purpose of clearing and finishing the same; but experience has demonstrated that it is not effectual for this purpose. It will remove the adhering particles
65 and give a certain measure of finish in the unexposed parts; but still those parts will be rough and unsatisfactory when its work is done compared with the exposed surfaces which have been subjected to the direct action
70 of the polishing materials. By my means these defects are positively obviated, and every part of a piece of metal is equally cleaned and polished whether the surface is plain and exposed or within or about an opening, or of
75 irregular outline, the form, shape, or construction of the metal being immaterial provided the parts thereof are accessible to my polishing material.

To this end my invention consists in the use
80 of small pieces of some soft yielding metal, like lead, with a polishing material, like emery, crocus, corundum, charcoal, or other similar substance, which, while it cleanses, will also abrade and polish the metal and give it
85 the desired finish.

In carrying out the invention the leaden pieces may be given any desired shape from angular to round; but I usually make them
90 round to start with, as they will soon wear to practically this form by use, and they may be of any size from, say, the size of a marble or larger down to the finest bird-shot.

The form and peculiarities of construction of the metal to be cleansed and polished will
95 generally determine the size of the lead to be used. Thus, if the metal is made with openwork, webbing, or the like, the surfaces of which are to be polished, I employ leaden balls according to the size of such openings, the
100

balls being designed to pass through the openings and enter into all parts thereof. The size of the openings will therefore determine the size of the balls, and if the metal is plain or
 5 has very large openings the largest size of lead would be used. Of course the larger and heavier the leaden pieces the more rapid the work, weight having very much to do with the speed and efficiency of their action. I there-
 10 fore use the heavier leads, or their equivalent in soft metal, when the character of the work will permit.

The grade of the abrading material to be used will depend largely on the quality of
 15 work to be done. When quick results are desired and finish is not so material, the heavier grades may be profitably employed. If a smooth polished surface is desired, the finer grades of material should be used. Indeed
 20 this method of dressing metals is capable of such a measure of refinement that it can be made to give a finish and luster not surpassed by the best known hand processes.

When emery, charcoal, or the like is used, a
 25 small quantity of oil added thereto will lend materially to its action and contribute to the finish of the work. The superiority of lead or kindred soft metal in lieu of the hard sharp tumbling-star or the like I desire especially
 30 to emphasize, for the reason that the use of such material for this purpose forms the nucleus of my invention. It will be seen that by the change of metal I retain sufficient weight and solidity to do efficient and speedy work,
 35 while the quality of the work is greatly enhanced by reason of the change. Thus, while with lead I avoid the injury to the polished surface which the harder metals will inflict, I am enabled by its use and by reason of its
 40 soft and yielding quality to change and embed its surface so completely with the polish-

ing material that I practically convert it into a new and different article. Thus, for example, if I employ emery as the polishing material, a ball of lead by the violent action to
 45 which it is subjected in the tumbler will become so filled with the material that in a comparatively short time it will be perceptibly larger than originally and its surface will be coated with the polisher. This practically
 50 converts the leaden mass into an emery ball, with the advantage, however, of having greater weight and consequently more efficiency than a ball of solid emery would have, while also the combined lead and emery does not smooth
 55 and gloss as in the case of solid emery. An emery ball would wear down and polish and lose its scouring properties; but the leaden ball will continue to take up emery particles, and thus maintain an effective grinding-sur-
 60 face. The leaden ball also retains its yielding quality, which better adapts it to this work. There, of course, is no wearing out of the lead when these accretions upon its surface occur.

To further carry out my invention a rumbler or tumbler of any approved form may be
 65 used.

Having thus described my invention, what I claim as new, and desire to secure by Letters
 70 Patent, is—

In the art of abrading and polishing, the combination of an abradent, as powdered emery, with small soft-metal bodies, as leaden balls, the abradent and metal bodies being
 75 separate and distinct elements, whereby when employed in a rumbler said elements cooperate in polishing exposed surfaces, substantially as set forth.

JNO. DEAN.

Witnesses:

H. T. FISHER,
 HENRY E. SOWER.