UNITED STATES PATENT OFFICE.

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METAL-PICKLE AND METHOD OF PICKLING.

1,191,291. Specification of Letters Patent. Patented July 18, 1916.

No Drawing. Application filed February 19, 1916. Serial No. 79,317.

To all whom it may concern:

Be it known that I, LOUIS C. DREFAHL, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Metal-Pickles and Methods of Pickling, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The present improvements, relating as indicated to a metal pickle and methods of pickling, have more particular regard to the avoidance of the objectionable effervescing or spraying of fine particles of liquid from the usual pickling compound, these drops of liquid being acid and being very injurious, not only to the surroundings of the pickling tanks, but also to any workmen who may be in the vicinity.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The following description sets forth in detail one approved method of carrying out the invention, such disclosed mode, however, constituting but one of the various ways in which the principle of the invention may be used.

The most commonly used pickling compounds for removing the scale from metal articles, (this scale usually consisting of an oxid of the metal) contain acids such as sulfuric or muriatic acids, or salts which contain appreciable quantities of free acids which act upon the scale on the metal to dissolve it, at the same time forming gas, which of course bubbles out of the liquid with sufficient violence to produce a mist or spray containing a certain amount of the acid solution. This spray is of course, very injurious to the surroundings of the tanks and to the operators. I have discovered a method of preventing this objectionable spray or mist and I accomplish this desirable end in a very simple and inexpensive manner by the use of a substance which in no way affects the action of the pickling compound.

My invention involves the use of cellulose pulp waste in a pickling compound, whether the latter consists of an acid solution or some acid containing salt such as niter cake or the like. This pulp waste may be used in varying amounts since it takes no part in the reaction on the metal, but serves only to produce a heavy foam or lather on the bath when any gas is evolved. Until gas is given off, the pulp waste remains quiescent in the pickling bath, but as soon as any metal articles are put in, and the acid of the solution attacks these articles, the gas given off produces a thick foam on the top of the bath. This foam has but one function, and that is, to serve as a filter or blanket for removing the particles of liquid from the gas. In this way, the evolution of gas is prevented from causing any spraying or effervescing of liquid, and consequently no injury is done to the surroundings or the operators. As soon as the evolution of gas ceases, the foam disappears, but is at once formed again when more gas is given off.

A convenient method of introducing the pulp waste in a pickling solution of niter cake is to add a small amount of the liquid cellulose pulp waste to the niter cake before the latter is sent to the pickling bath, although it may be added directly to the bath if desired. The amount is determined largely by the violence of the reaction, since the greater the evolution of gas, the heavier the foam must be to prevent the spraying of particles of liquid through it. Since the cellulose pulp waste takes no part in the pickling action, it follows that it may be added in various amounts without detriment to the effectiveness of the pickling compound. I prefer ordinarily to use cellulose pulp waste to the extent of about 5 or 6% of the weight of the pickling compound.

In case the pickling bath is a straight acid solution such as sulfuric acid for example, then a convenient method of adding the cellulose pulp waste is in the dried form. This dried pulp waste is added directly to the pickling solution in approximately the same proportions as when used in the liquid state and preferably will be first mixed with twice its weight of copperas which, while serving no useful purpose in the pickling solution, is the same substance as the resulting solution after the reaction upon the metal articles, namely ferrous sulfate. It will be appreciated that other substances than copperas may be employed with the dried cellulose pulp waste, provided they do not interfere

with the reaction of the acid upon the metal, nor constitute any substance that will injure the value of the resulting compound of the pickling bath.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the process herein disclosed or the materials employed in carrying out the process, provided the step or steps stated by any of the following claims or the equivalent of such stated step or steps be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A metal pickling bath which consists of an acid containing substance and cellulose pulp waste.

2. A metal pickling bath which consists of an acid containing substance and a small amount of cellulose pulp waste.

3. A metal pickling bath which consists of an acid containing substance and approximately six per cent. (6%) of cellulose pulp waste.

4. In a method of preventing the effervescing of a metal pickling solution the step which consists in adding to such solution a small amount of cellulose pulp waste, thereby producing a thick foam on such solution.

Signed by me, this 16 day of February, 1916.

LOUIS C. DREFAHL.

Attested by—
W. T. CASHMAN,
E. R. BAILY.