E. DITHRIDGE.

PNEUMATIC SIEVE.

APPLICATION FILED APR. 1, 1908.

949,625. Patented Feb. 15, 1910.

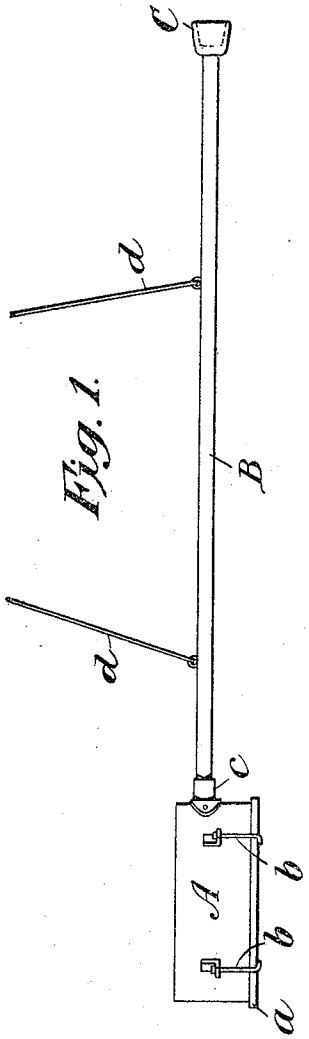

Fig. 1.

Fig. 2.

Attest:

W. A. McGinn

A. A. Hachle

Edward Dithridge Inventor:

by W. P. Preble Jr his Atty.

UNITED STATES PATENT OFFICE.

EDWARD DITHRIDGE, OF MORRISVILLE, PENNSYLVANIA, ASSIGNOR TO THE J. L. MOTT IRON WORKS, A CORPORATION OF NEW YORK.

PNEUMATIC SIEVE.

949,625. Specification of Letters Patent. Patented Feb. 15, 1910.

Application filed April 1, 1903. Serial No. 424,496.

To all whom it may concern:

Be it known that I, EDWARD DITHRIDGE, a citizen of the United States of America, and a resident of Morrisville, in the county of Bucks and State of Pennsylvania, have invented certain new and useful Improvements in Pneumatic Sieves, of which the following is a specification.

The object of my invention is to provide a pneumatic sieve of exceedingly simple construction; which can be very readily and easily handled; and the action of which, in delivering its contents, can be very readily and easily controlled.

My invention relates more particularly to that class of sieves which is commonly known as a dredger, that is to say, a sieve which is designed to receive material of uniform size and to sift, sprinkle or discharge the same upon some object which it is designed to coat or cover. Such sieves have long been used in the enameling of bath tubs and other castings in which case the material to be sifted consists of dry powdered enamel. This enamel is sprinkled dry over the surface of a red-hot tub or other casting and fuses with the heat of the article to which it is applied. My invention, however, is applicable with advantage to other styles of sieves, namely, those in which materials of different sizes are to be assorted by jarring the contents of the sieve so that the smaller particles fall through, and is also applicable to foundry sieves in which sand for molding purposes has to be repeatedly sifted between the breaking up of old molds and the forming of new ones. It is also applicable with advantage to flour bolts, and, in fact, to all sifting apparatus where the desired effect can be produced by a constant slight trembling or shaking of the sieve and its contents. In devices heretofore used for this purpose, where the body of the sieve was not itself moved back and forth so as to disturb the contents and keep them in motion, the necessary jar for keeping the meshes of the sieve from clogging and to cause the material to flow as desired through the sieve has been caused by some form of automatic or pneumatic tapper or hammer which operated mechanically or pneumatically to strike the side of the sieve with such force and such frequency as experience showed the particular purpose in view required. When such automatic or pneumatic means were not employed the blows were given by a hand hammer or beater which had the advantage over the automatic or pneumatic tapping that it could be instantly stopped whenever occasion arose. When such automatic or pneumatic tappers were employed they were attached or secured to, and consequently carried by, the sieve or the sieve handle or the frame-work supporting the sieve, and sometimes this was the case also with the hand tapper.

Among the disadvantages inherent in having the hammer or agitator or beater or tapper or whatever it may be called secured to or carried by the sieve or dredger or anything rigidly connected with it, I have found the following: It is difficult and sometimes impossible to stop the blows suddenly. It is difficult to vary and control the force of the blows. When either the tapper or the sieve gets out of order the apparatus is out of commission until repairs are made. The motive power has to be stopped in order to stop the flow of material from the sieve. There are other disadvantages. To overcome these disadvantages, and to combine the advantages of an automatic or pneumatic tapper with those of the old hand tapper, I provide an apparatus in which the tapping device is not carried or in any way attached to or secured to the sieve, but is entirely separate from it as was the case with the old hand tapper. Yet the sieve is so constructed that it can be operated by the aid of a pneumatic hammer or any other power-driven automatically-operating device so as to take advantage of the rapidity of succession in the taps administered.

In carrying out this invention, therefore, I provide a sieve or sifting apparatus which is complete in itself and which is adapted to receive the necessary taps from any suitable tapping device, power-driven or hand-operated. And I provide a power-driven tapper, preferably a pneumatic hammer, of a size and weight adapted to be conveniently held in the hand of the workman, and to be brought into contact with said sieve whenever a tapping action is desired.

When my improved pneumatic sieve is used for enameling bath tubs it is preferable to have the handle of the sieve supported by chains or otherwise from the ceiling of the foundry or other fixed support in sufficient proximity to the cradle on which the

tubs are deposited on removal from the furnace so that the enameler does not have to support the weight of the sieve at all, but simply guides it over the turning tub as occasion requires by controlling its movements through grasping the end of the long handle. When the sieve is used on small ware so that less enamel is required for the coat and the operative is not exposed to such an intense radiation of heat, the sieve may be small enough and light enough to carry in the hand and not require this outside or over-head support.

In the accompanying drawings I have shown a simple form of my improved device.

Figure 1 is a side elevation of the sieve. Fig. 2 is a side elevation of an ordinary pneumatic hammer such as used for many purposes, including the chipping of bath tubs when provided with a suitable chisel or chipping tool, and showing a part of the air supply pipe.

I use this without any chisel or substitute therefor because the tapping which I employ does not consist of positive blows delivered against the side of the sieve as has heretofore been the case, but is more in the nature of a vibration or a succession of shaking or trembling undulations passing molecularly through the substance of the handle and sieve, from which they are delivered to the material in the sieve. The molecular agitation of this material thereby becomes sufficient to cause it to flow steadily through the meshes of the sieve. This flow lasts while the agitation lasts, stops when the agitation stops, and varies with the amount of agitation which is easily controlled.

A is a sieve of suitable construction which, as usually employed for enameling bath tubs, is a drum-shaped body of circular form made of metal with a mesh of fine wire stretched over the bottom and drawn tight by means of the band *a*, and screw-threaded rods *b*, *b*, in the usual way. B is a handle, preferably solid and of wood, although a hollow metal handle or a metal handle filled with wood might be substituted, if preferred. This handle is attached to the sieve by a suitable socket *c*, and is preferably suspended from the ceiling or other fixed support by chains, cords, or wires *d*, *d*. There is nothing new about this part of the construction, the handle being old and the sieve being old, as well as the means for tightening the sieve mesh and for attaching the handle to the sieve.

The novelty of my improved sieve consists in providing a cup C, which is attached to any convenient part of the sieve handle, preferably at the extreme end, as shown. By the addition of this cup the sieve becomes adapted for operation by any suitable hammer or beater whether electric, pneumatic, hydraulic, or driven by steam or any mechanical power.

D represents a pneumatic hammer or tool of usual construction and may be any of the usual and well-known types, which have been put upon the market, in which an internal agitation is produced by the rapid driving back and forth in the interior of the hammer of a piston or other moving part by the admission and exhaust of air or any suitable gas. Sometimes these hammers have a valve and sometimes they are valveless. As heretofore used such hammers have been provided with some kind of a tool such as a chisel, a gouge, a bit, a hammer-head, or some other device the shank of which enters the nozzle of the hammer and receives the blows of the reciprocating piston. In my use of these hammers I dispense with any such auxiliary tool as I do not utilize or desire to use any direct pounding action but simply the molecular vibration caused by the rapid reciprocation of the piston back and forth inside the hammer, which vibration is communicated to the wooden handle from the air inside of the hammer, which air enters through the flexible tube *e*.

The cup or funnel C, serves chiefly as a guide or rest for the nozzle of the hammer or other beating device, and the interior, therefore, may be tapered as shown in dotted lines so as to present a recess of such size and shape as to permit the nozzle to enter and to be withdrawn easily. It is not desired to make a tight fit, yet the cup should not be so large relatively to the nozzle as to lose its usefulness in preventing the nozzle from too great sidewise or up and down moving while in action.

In using this improved sieve the workman holds the hammer D, easily in his hand by grasping the roughened collar *f*, and inserts the nozzle *g*, in the cup C, so that his hand rests partly on the hammer and partly on the cup holding the two together by an easy grasp. I have found that while large variations in the vibratory action of the hammer can be brought about by controlling the valve which admits air to the hammer so as to supply greater or less power, such control will be very seldom required, but the smaller variations, upon which the proper and effective use of the sieve depends, are controlled by simply tightening or relaxing the muscles of the hand in holding the hammer and the cup. If it is desired to have the enamel flow a little quicker all the workman has to do is to tighten his grip, and if slower to loosen his grip.

As is well-known in enameling tubs and other articles by the dry process, that is, sprinkling dry powdered enamel on the red-hot surface of the article to be enameled either the sieve has to be moved over the

surface or the surface has to be moved under the sieve. In both cases it frequently becomes necessary to stop the flow abruptly in order to avoid putting too much enamel on some spots or wasting the enamel by allowing it to fall when the tub is not in the proper position to receive it. I have found that the nozzle can be drawn back in the cup much more quickly, and the flow of enamel thereby stopped much more abruptly than is possible when the momentum of the vibrating agitator has to be checked by simply turning the control valve or by the application of some other mechanical brake. In this way I secure all the advantages of the personal skill of an experienced workman which attended the use of the old hand beater, and avoid the disadvantages of an automatically operated beater secured to the sieve. Another great advantage of my improved sieve lies in the fact that where several furnaces are employed individual sieves without any agitator can be left in their proper position for their own furnaces while the agitators may be carried to those sieves for which tubs are ready. In this way great saving in boiler capacity and in the number of agitators can be brought about as will be well understood by those skilled in the art. In the case of bath tubs, as is well known, the tub has to remain for some ten to twenty minutes in the furnace before it is hot enough to receive the first coating and also between successive coatings while the time consumed in putting on a coat of enamel is only from three to five minutes. By so timing the different furnaces that a tub can be brought out from one furnace while a tub is being returned to the adjacent furnace the same pneumatic hammer can be transferred from one sieve to the other without any trouble or delay so that one hammer would be sufficient for several sieves. The many other advantages of this improved device will, I think, be readily understood without further description.

I claim:

A pneumatic sieve composed of a suitable sieve body, a supporting handle adapted to receive and transmit a jarring motion to said sieve body, and a cup attached to said handle of sufficient size to allow the end of a pneumatic hammer to enter and withdraw freely, and adapted to receive vibrations therefrom and to transmit the same to said handle.

EDWARD DITHRIDGE.

Witnesses:
A. A. HOEHLE,
W. P. PREBLE, Jr.