

UNITED STATES PATENT OFFICE.

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PULVERIZING PROCESS.

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My invention relates to processes for producing fine powders particularly metallic powders by causing particles of the substance to be pulverized to repeatedly collide with each other because of the action of fluid eddies. In the mills already provided for this purpose the particles are carried along in a closed chamber by gas eddies moving in opposite directions and thus causing the particles to impinge upon each other, such as for instance described and shown in my Patent No. 1,573,017 of Feb. 16, 1926. In this manner, the disintegration process, even of very soft metals, can be carried to a very great extremity. The power required to obtain an extremely fine powder varies with the kind of substance or metal treated.

The object of the present invention is to improve the above said process which I accomplish by considerably reducing the power required for the operation of the pulverizing mill while at the same time increasing an output many times above that obtained by the present method.

The present invention also enables the structure and shape of the individual particles of the fine powder obtained to be affected.

This I accomplish by adding to the material to be pulverized a small percentage by volume of a lubricant which spreads over the particles during the pulverizing process in the form of a thin coating or skin.

The quantity of the oily or fatty admixture is preferably such that even the finest particles will become covered with an extremely thin coating or layer, but the coating must not be too thick as this would result in the particles sticking together so as to interfere with, or even completely stop, the process of disintegration. Therefore, the quantity of lubricant added must only amount to a few percent by volume.

The lubricants employed are chiefly oils, fats, wax, paraffin, stearin and oily substances, such as turpentine, tetralin and the like.

The increase in the efficiency of the pulverizing process is astonishing and very consid-

erable. Thus, in the treatment of soft metals, such as aluminum, lead, tin and the like, with an admixture of lubricant as much as ten times the present output with the same power consumption may be obtained. Even in the case of metals, like copper, a threefold or even greater increase of output can be obtained.

In the practical application of my novel process about 1.5 gr. of olive oil is added to 1 kg. of copper, or 10 gr. of paraffin are added to 1 kg. of aluminum or tin. The lubricant may be continuously fed into the pulverizing mill during the operation of the same, or it may be mixed with the material to be pulverized, before said material is placed in the mill.

An advantage of the continuous feed method is that the contents of lubricant in the material to be pulverized can be better regulated and consequently more easily kept in its proper proportion. The shape of the individual particles of the pulverized material is affected in a peculiar manner by the kind of lubricant used. Thus, the particles may be ball-shaped or may have the shape of small flakes according as the one or other kind of lubricant is used. If olive oil is added to aluminum a powder is obtained the particles of which are substantially ball-shaped, whereas an admixture of paraffin will cause substantially flake-shaped particles to be formed. The particular kind of particles obtained depends upon the kind of metal, the kind of lubricant, the duration of the pulverizing process and other factors. It can be best ascertained in each case by experiment.

If the lubricant added is undesirable in the finished powder it can be subsequently removed by washing, or preferably by steam to the required extent.

The admixture may also be composed of a mixture of different kinds of fatty substances, such as fats, oils, wax, paraffin, stearin and the like. The most effective admixture and the most favorable proportion of the same should be ascertained in each instance by experiment.

I claim:—

The process of pulverizing metals in a dry state comprising causing the metal particles to repeatedly impinge upon each other by means of a plurality of opposed fluid currents continually circulating within a closed space, and adding to the metal particles dur-

ing the pulverizing operation a maximum of 2% of a fatty substance adapted to coat all the metal particles with a very fine film leaving the metal particles in a dry state. 10

In testimony whereof I have affixed my signature.

DR. EMIL PODSZUS.