

UNITED STATES PATENT OFFICE.

WALTER O. SNELLING, OF PITTSBURGH, PENNSYLVANIA.

COATING PROCESS.

1,204,709.

Specification of Letters Patent.

Patented Nov. 14, 1916.

No Drawing.

Application filed August 2, 1915. Serial No. 43,124.

To all whom it may concern:

Be it known that I, WALTER O. SNELLING, a citizen of the United States, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Coating Processes, of which the following is a specification.

My invention relates to the production of finely-divided material composed of individually coated particles, and it has for its object to provide a simple and effective process of producing finely subdivided material, particularly metallic filings and granules, composed of individual particles coated with varnish or other substances.

A special application of my invention is in the production of iron filings, aluminum filings and the like, for use as ingredients in explosives and fireworks.

My process consists essentially in wetting a mass of finely divided material with a suitable liquid coating substance, preferably containing a volatile vehicle or solvent, and exposing the wetted mass to the separating action of currents of air or other gas, under such conditions that the constituent particles of the mass are kept separate and are dried while thus separated. In this manner, the particles are coated as individuals, and not in aggregates or lumps.

I have practised the foregoing process in several different ways, one of which consists in placing the wetted mass of material, including a volatile liquid, in a closed vessel or bomb, which is heated to a temperature above the boiling point of the volatile liquid, and then suddenly opened. The sudden expansion of the volatile liquid, and of the gas which it has evolved in the vessel, forcibly drives out the solid particles and thoroughly scatters them, while at the elevated temperature, the particles are immediately dried and are found to be evenly and individually coated with the varnish or other coating substance.

As indicated above, an important application of my process is in treating finely divided metals, which are now largely used in explosives and fireworks. Aluminum filings, for example, are employed in the manufacture of explosives, and iron filings are common ingredients in certain forms of sparkling fireworks. It is found that explosive mixtures containing metallic fragments deteriorate rapidly, for the reason that the

metals are quickly oxidized by the nitrates or other oxidizing agents that are used in these mixtures.

According to my present invention, I obviate the difficulty just mentioned by protecting the metallic particles with a coating which resists slow oxidation, but which is preferably combustible. Convenient varnishes for this purpose are composed of solid organic esters, nitrocellulose, for example, dissolved in appropriate solvents, such as alcohol, ether, benzol, acetone, and the like. Celluloid dissolved in a suitable solvent also forms a desirable waterproof and inflammable coating.

It is not to be understood that my invention is restricted to the coating of metallic particles with inflammable substances, since my process may be employed equally well for providing other kinds of small objects with coatings of any kind. Ordinary varnishes, containing shellac, copal or other gums, may be used with good results.

Inasmuch as my process may be so widely varied without exceeding the limits of my invention, it is to be understood that no restrictions are to be imposed upon my invention unless indicated in the appended claims.

I claim as my invention:

1. The process of coating finely-divided material that comprises treating the material with a liquid coating substance containing a vaporizable vehicle, placing the treated material in a closed container, heating the contents of the said container above the boiling point of the said vehicle, and suddenly opening the container.

2. The process of coating finely-divided material that comprises treating metallic particles with a liquid coating substance containing a vaporizable vehicle, placing the treated material in a closed container, heating the contents of the said container above the boiling point of the said vehicle, and suddenly opening the container.

3. The process of treating finely-divided material that comprises applying to the material a liquid coating substance containing a vaporizable vehicle and a combustible residue, placing the treated material in a closed container, heating the contents of the said container above the boiling point of the said vehicle, and suddenly opening the container.

4. The process of coating finely-divided

material that comprises applying to the material a liquid coating substance containing a vaporizable vehicle and a combustible cellulose ester, placing the treated material in a closed container, heating the contents of the container above the boiling point of the said vehicle, and suddenly opening the container.

5. The process of preparing metallic particles for pyrotechnic use that comprises treating such particles with a liquid coating substance containing a vaporizable vehicle and a combustible cellulose ester, placing the treated material in a closed container, heating the contents of the container above the boiling point of the said vehicle, and suddenly opening the container.

6. The process of preparing oxidizable particles for pyrotechnic use that comprises treating such particles with a liquid coating substance containing a vaporizable vehicle and a combustible cellulose ester, placing the treated material in a closed container, heating the contents of the container above the boiling point of the said vehicle, and suddenly opening the container.

In testimony whereof, I have hereunto subscribed my name this 30th day of July, 1915.

WALTER O. SNELLING.

Witnesses:

M. R. McKEOWN,
J. G. KAISER.