United States Patent

Claeys

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[54] **METHOD FOR DEFLASHING CERAMIC MATERIALS**

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[52] **U.S. Cl.** **51/320**, 51/14, 264/67, 264/161, 425/806

[51] **Int. Cl.**.....**B24c 1/00**

[58] **Field of Search** 51/320, 9, 13, 14, 15; 264/67, 264/161; 425/806

[56] **References Cited**

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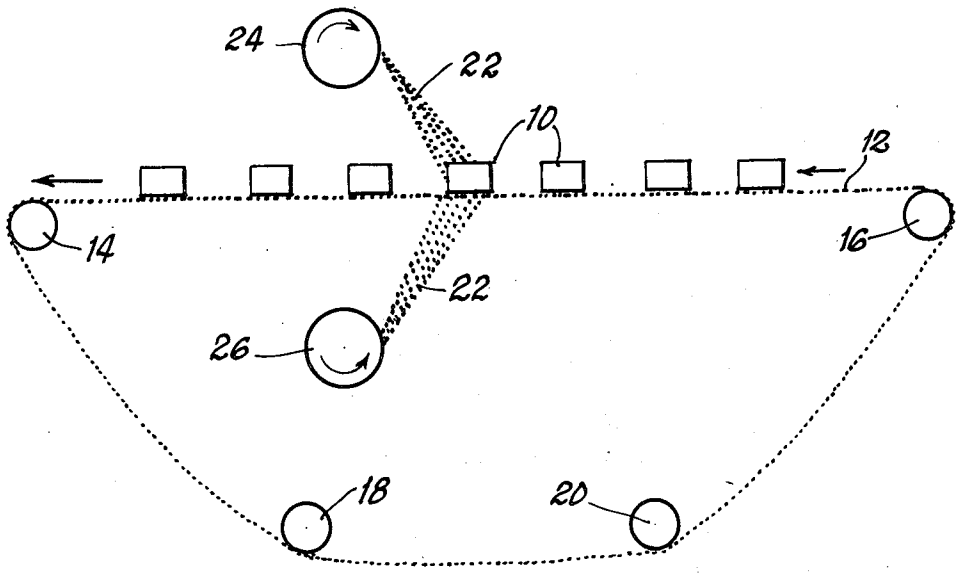
Primary Examiner—Lester M. Swingle

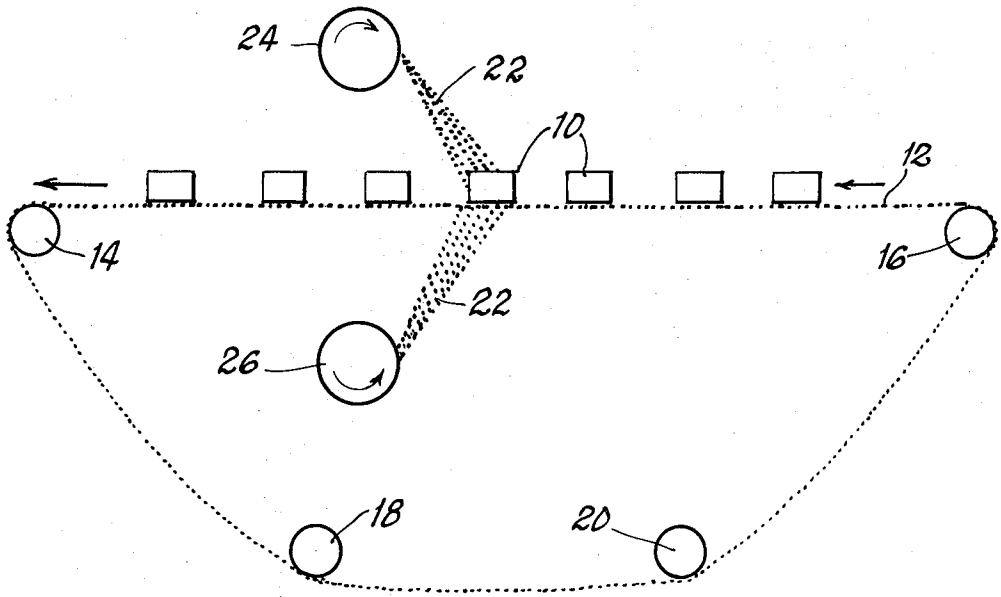
Attorney—McDougall, Hersh & Scott

[57] **ABSTRACT**

This invention is addressed to a new and improved method for deflashing unfired ceramic materials by centrifugal blasting wherein the ceramic materials are subjected to an airless barrage of rubber particles.

6 Claims, 1 Drawing Figure





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METHOD FOR DEFLASHING CERAMIC MATERIALS

This invention relates to a method for deflashing unfired ceramic materials.

In U.S. Pat. Nos. 2,204,633, 2,204,634, 2,819,562, 2,909,870, 2,918,758, 2,996,846, 3,137,101, 3,352,064, and 3,513,597, description is made of the use of centrifugal blasting wheels for cleaning and/or deflashing articles formed of metal, molded rubber, etc. Briefly described, a centrifugal blasting wheel includes a plurality of throwing blades radially mounted between a pair of laterally spaced side wall-forming disc members, which is mounted for rotational movement at high speeds on a shaft.

The blades extend radially inwardly from the periphery of the wheel for a short distance from the axis of rotation to define a central opening or space therebetween for the introduction of abrasive which is centrifugally thrown from the periphery of the wheel. Directional control of the abrasive is usually achieved by feeding the abrasive onto the blades over a predetermined portion of their rotation. For this purpose, use is made of a central cage in the form of a tubular member having a discharging opening in the periphery thereof and which is stationarily fixed in the opening with means for adjustment to predetermine the location of the discharge opening through which the abrasive is fed onto the blades.

The abrasive thrown from the periphery of the wheel is directed to the articles to be cleaned and/or deflashed in the form of an airless barrage of abrasive projectiles traveling at high speeds whereby the abrasive particles serve to remove flashings, fins and the like from such articles. As described above, the centrifugal airless blasting technique is most frequently used with articles formed of metal or molded rubber, and the abrasive is usually in the form of sheet shot, aluminum shot, steel girt, soft girt, quartz sand, as well as a variety of other abrasive materials.

Many ceramic parts also require deflashing and final forming prior to firing. However, since the surfaces of unfired ceramic materials, such as unfired porcelain, are soft and fragile, it was thought that airless centrifugal blasting techniques could not be readily adapted for use in deflashing ceramic materials. Many types of abrasive media have been attempted in an effort to adapt airless centrifugal blasting for use with unfired ceramic materials but without success. As a result, many ceramic parts require hand deflashing and final forming prior to firing.

It is accordingly an object of the present invention to provide a method for airless centrifugal blasting adapted for use in deflashing unfired ceramic parts.

It is a more specific object to the present invention to provide an airless centrifugal blasting method suitable for use with unfired ceramic parts or articles in which damage to the ceramic article is substantially avoided, and which is capable of providing a clean, completely deflashed article in a simple and efficient manner.

These and other objects and advantages of the invention will appear more fully hereinafter, and, for purposes of illustration, but not of limitation, an embodiment of the invention is shown in the accompanying drawing in which the FIGURE shows a schematic diagram of an air centrifugal blasting method embodying the concepts of this invention.

It has been found, in accordance with the concepts of the present invention, that ceramic articles and parts, and particularly those formed of unfired ceramic materials, can be simply and efficiently deflashed by airless centrifugal blasting by the use of small particles of rubber as the blasting media. The use of small particles of rubber has been found to completely deflash such unfired ceramic parts without damage or injury to the body of the parts.

As used herein, the term " rubber" is intended to refer to and include natural rubber and the synthetic rubber including butadiene-styrene rubber, neoprene rubber, isoprene rubber, chloroprene rubber, isobutyl rubber, EPDM rubbers, polysulfone rubber and like elastomeric polymers and copolymers. One source of rubber particles which are particularly advantageous in the practice of the present invention are particles formed by grinding rubber automobile floor mats.

The size of the rubber particles employed in the practice of the invention is not critical, and depends upon the nature of the ceramic material treated as well as the diameter and speed of the blasting wheel, In most applications, it is preferred to make use of rubber particles having sizes within the range of 4 to 30 mesh, and most preferably 10 to 16 mesh.

The centrifugal blasting equipment is generally similar to that described in the foregoing patents which is modified to accommodate the flow of the rubber media. A schematic illustration of such equipment is shown in the drawing. As shown, the articles **10** formed of unfired ceramic materials are advanced along a foraminous conveyor **12**, which is preferably a wire mesh endless belt carried by rollers **14**, **16**, **18**, and **20**. The parts **10** are advanced to an airless barrage of rubber particles **22** which are centrifugally thrown from the periphery of one or more centrifugal blasting wheels **24** and **26** which are of the type described in the aforementioned patents. As is shown in the figure, the particles from wheel **24** located above the mesh screen **12** are thrown down onto the parts **10**, and the rubber particles thrown from wheel **26** positioned below mesh screen **12** pass up through screen **12** to the articles **10**.

The inter-related factors of the diameters and speeds of the blasting wheel or wheels **24** and **26** depend upon the severity of blasting desired, with greater wheel diameters and/or greater rotational speeds favoring greater severity in blasting. In general, the wheel diameters and rotational speeds employed in the practice of this invention are somewhat less than those usually employed in centrifugal blasting operations as applied to metal parts and the like. It has been found in accordance with the preferred practice of this invention that use can be made of wheels having diameters within the range of 8 to 21 inches, and which are rotated at speeds within the range of of 800 to 2,600 r.p.m. For example, excellent results have been obtained using wheels having 15-inch diameters running at 1,400 r.p.m. for electrical parts formed of unfired porcelain.

While the method of the invention has been described above using two blasting wheels, one above and the other below the conveyor screen, it will be understood that use can also be made of a single wheel or a plurality of wheels located above or below the conveyor screen or conveyor.

It will similarly be understood that it is possible and frequently desirable to recover the rubber media and flashing, segregating the reusable media and recycling the latter to the blasting wheels for reuse.

It will be apparent that various changes and modifications can be made in the details of equipment, procedure and use without departing from the spirit of the invention, especially as defined in the following claims.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A method for deflashing unfired ceramic articles comprising subjecting the articles to an airless barrage of particles of rubber.

2. The method of claim 1 wherein the articles are formed of unfired porcelain.

3. The method of claim 1 wherein the particles have sizes within the range of 4 to 30 mesh.

4. The method of claim 1 wherein the airless barrage is created by at least one centrifugal blasting wheel.

5. The method of claim 4 wherein the wheels have a diameter within the range of 8 to 21 inches.

6. The method of

4 wherein the wheels are driven at a speed within the range of 800 to 3,600 r.p.m.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,696,565 Dated October 10, 1972

Ronald Claeys

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 4, line 10, after "of" insert -- claim -- .

Signed and sealed this 10th day of April 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents