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ABRASIVE CARRIER FOR PROCESSING ARTICLES

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1 Claim. (Cl. 51—164.5)

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This invention relates to the processing of articles for removing the rough surfaces produced in the manufacture thereof and to impart thereto a smooth lustrous finish.

The invention has in view an abrasive carrier having the ingredients required for the abrasive operation applied to the surface thereof.

Another object of the invention is to provide a moisture containing carrier which retains the carrier and the abrasive in a moist or damp condition to thereby produce an effective abrasive action on the articles when rolled or tumbled therewith in a tumbling barrel or the like.

Another object of the invention is to provide a porous fibrous carrier having a viscous coating applied thereto in covering relation with the pores in the carrier for retaining liquid in the pores and which coating forms a base for bonding the abrasive to the carrier.

Still another object of the invention is the provision of a carrier of said character which is adapted for cutting down, burnishing and polishing both hard and soft metallic and plastic articles which requires less abrasive material than heretofore employed in the polishing of metal and plastic articles and which does not create dust during the tumbling operation, while eliminating scratching and pitting of the articles and provides an increased abrasive surface so as to lessen the time required to process the articles.

Still another object of the invention is the provision of a carrier which eliminates the necessity of employing sawdust, wood chips, wooden pegs, bone or ivory pellets so as to render it unnecessary to pack or fill openings or recesses in the articles which must be done when employing sawdust, wood chips and the like in order to prevent the same from becoming packed in the openings or recesses.

In producing the abrasive material corn cob granules are utilized as the carrier which are cellular in structure and adapted to absorb liquid such as water, kerosene, lubricating oil and the like and to retain the liquid in the pores thereof so that the carrier remains in a moist condition for an extended period of time. The carriers are moistened with a liquid depending upon the nature of the processing operation and after the liquid has been absorbed by the carrier, the carrier is then treated with a viscous bonding agent such as liquid collodion or liquid sodium silicate to provide a self-hardening coating on the outer surfaces of the granules so as to cover the pores of the granules and provide a base for bonding the abrasive to the carrier. When the bonding

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agent is still in a wet or tacky condition on the outer surfaces of the corn cob granules powdered abrasive is applied thereto to embed the same therein and to form an abrasive surface covering the coating. A lubricating vehicle is then applied to the treated corn cob granules which covers the abrasive with a thin film thereof and effectively seals the liquid contained in the cells thereof.

Produced in this manner the carrier holds on the outer surfaces thereof all of the ingredients required in the processing operation. In processing the articles the same are tumbled with the carrier to effect a cutting down or deburring of the rough surfaces produced by the manufacture thereof. The tumbling is repeated with a carrier having a finer grade of abrasive to effect a smoothening of the surfaces of the articles and finally the articles are tumbled with a carrier having an extremely light polishing powder to effect a burnishing and polishing of the exterior of the surface of the articles. The action of the liquid on the corn cob granules together with the deposit of the abrasive ingredients thereon, produce a carrier without sharp edges or of rounded formation which eliminates pitting of the articles.

In carrying out the foregoing tumbling operations the articles to be finished are placed in a tumbling barrel or the like and are embedded in or substantially covered with the carrier to which the abrasive and lubricating vehicles have been applied as hereinbefore described. After a short period of tumbling the articles become coated with a thin film of the lubricating vehicle. Further tumbling causes some of the abrasive to wear off of the corn cob granules and to adhere to the coating on the articles. Both the articles and the carrier being coated with the abrasive will produce an abrasive action on the articles by the tumbling of the articles with the carrier so as to remove the rough outer surfaces and apply a smooth, lustrous finish free from scratches and pitting. The moisture in the carrier retains the corn cob granules together with the bonding agent and abrasive in a damp condition which facilitates the cutting action of the abrasive on the surfaces of the articles.

The carrier is prepared for the first or cutting down operation by moistening the corn cob granules with a liquid in the proportion of approximately eighteen or twenty pounds of granules to one quart of liquid such as water or kerosene. This may be done by tumbling the corn cob granules with the water or kerosene sprinkled thereover in a tumbling barrel or the like for approximately ten minutes. The cellular structure of

the corn cob expands by the action of the liquid which takes up or absorbs the same. When employing pumice as the abrasive, the corn cob granules are preferably treated with water while the corn cob granules are preferably treated with kerosene when using emery as the abrasive. Approximately three-quarters of a pound of liquid collodion, liquid sodium silicate or equivalent gelatinous bonding agent is then added to the moistened corn cob granules which are thoroughly coated therewith by tumbling the same for approximately ten minutes, after which two pounds of pumice, emery or an equivalent abrasive is applied to the coated granules when the coating is still in a wet or tacky condition so that the abrasive adheres to and covers the coating. In the event that a heavier coating of abrasive is desired a few ounces of water may be added after which a few ounces of pumice may be tumbled with the treated corn cob granules. A lubricating vehicle is then applied to the aforesaid proportion of corn cob granules consisting of approximately two ounces of oleic acid, four ounces of tallow and two ounces of glycerin which is thoroughly coated therewith by tumbling the same for approximately one-half hour. The lubricating vehicle completely covers the pumice and seals the cellular structure of the granules so as to maintain the moistened condition of the granules for a considerable period of time.

The aforesaid proportion of treated corn cob granules may then be utilized to process metallic or plastic articles in the proportion of two parts by volume of carrier to one part by volume of the articles which are distributed throughout and embedded with the carrier in the tumbling operation. The tumbling of the articles with the carrier creates sufficient friction to heat the carrier so that the lubricating vehicle coats the outer faces of the articles with a thin film thereof, after which some of the abrasive works loose from the coating which adheres to the film covered articles. The moisture in the carrier maintains the abrasive in a moistened condition to produce an effective cutting down or abrading operation.

For the second or smoothening operation, the carrier is prepared in a similar manner to that described in connection with the preparation of the same for the first or cutting down operation but in place of the granules being expanded by the action of water, the same are treated with light lubricating oil which is absorbed or taken up by the granules. A finer abrasive is employed in connection with the second operation and the same may consist of polishing powders such as aluminum oxide, precipitated chalk or the like. The abrasive is applied to the granules coated with the self-hardening bonding agent in substantially the same proportions as described in connection with the first operation and thereafter the abrasive coated granules are treated with a lubricating vehicle consisting of approximately two ounces of oleic acid, four ounces of tallow and two ounces of glycerin. The carrier prepared as aforesaid is utilized to process metallic articles in the proportion of approximately two parts by volume of carrier to one part by volume of the articles. The tumbling operation similarly coats the articles being tumbled with a thin film of the lubricating vehicle after which some of the abrasive works loose from the carrier and adheres to the film covered articles. The liquid absorbed by the carrier maintains the abrasive together with the corn cob granules in a moistened condition and since the abrasive is relatively mild the same effects a smoothening of the exterior surfaces of the articles.

For the third or polishing operation the carrier is prepared in a similar manner but instead of the abrasive employed in connection with the first and second operations, an extremely light precipitated chalk, Paris white, rouge, crocus or fine polishing powder is utilized which is bonded to the corn cob granules in a manner similar to that hereinbefore described.

What is claimed is:

An abrasive carrier for processing articles including corn cob granules expanded by water and containing water in the cells thereof, a powdered abrasive, and a coating of sodium silicate bonding the abrasive to the granules and forming a covering over the cells of the granules.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
Re. 21,432	Lupo	Apr. 23, 1940
224,078	Copeland	Feb. 3, 1880
2,191,803	Oesterle et al.	Feb. 27, 1940
2,318,578	Malz	May 11, 1943
2,328,998	Radford	Sept. 7, 1943