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A. E. STANLEY

2,010,330

ABRADING OR RUBBING ARTICLE

Filed March 22, 1934

Fig. 1.

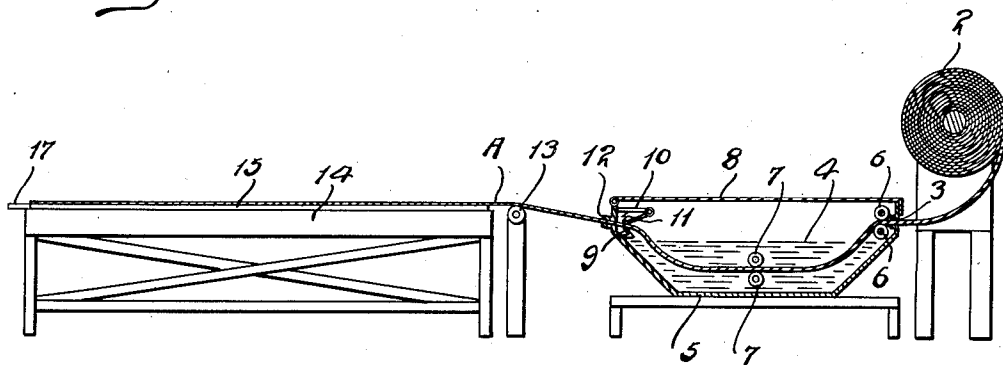


Fig. 2.

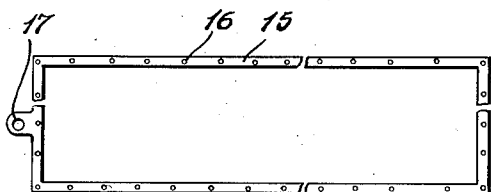


Fig. 3.

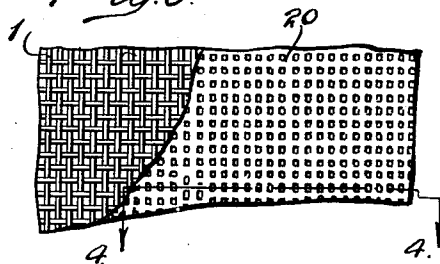


Fig. 5.

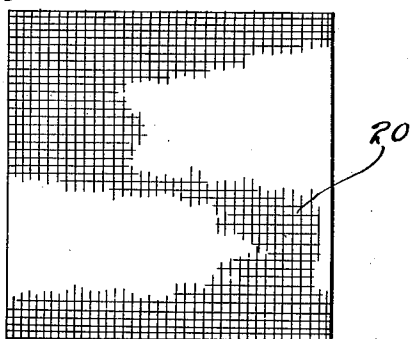


Fig. 4.



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ABRADING OR RUBBING ARTICLE

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3 Claims. (Cl. 51—280)

This invention has to do with an article for abrading purposes, and a method for making such an article. The invention is concerned particularly with an article especially adapted for use in wet scouring, sanding, rubbing and similar operations, all of which are generally termed herein an abrading operation. By the use of the term "wet" it will be understood that the abrading operation is to be performed in the presence of a liquid, such as water, as distinguished from a dry operation.

Generally, the article comprises a body material of fabric, which material is preferably capable of absorbing moisture, as for example, a fabric of woven cotton or the like. On or in this fabric is disposed a binding or adhesive substance preferably insoluble to water or other liquid which is to be used in the wet abrading operation. This binder or adhesive material carries an abrasive which may be one or more of several different kinds and of varying screen mesh depending upon the use to which the particular article is to be put.

For the purpose of more clearly explaining the invention, one form of device for carrying out the same is described and set forth in full herein. This form may have a body material of woven fabric, which may be cotton, in which the weave is somewhat of open construction, leaving relatively generously sized interstices between the fabric cords. The binder with the abrasive is to be carried by this body material. This binder advantageously and preferably is composed of a cellulose ester such as nitrocellulose (pyroxylin), cellulose acetate, and others. Nitrocellulose has been found to be satisfactory, and in the following detailed description reference will be made to nitrocellulose, although it is to be understood that the invention covers insoluble binders generally, and particularly cellulose esters.

In applying the binder to the body material the nitrocellulose is cut with one or more suitable solvents. Such solvents are well known to those versed in the art and include ethyl acetate, butyl acetate, ethyl alcohol, methyl alcohol, benzol, ether, etc. It has been found, however, that a commercial lacquer thinner is satisfactory. For example, the nitrocellulose may be wet down with a non-solvent constituent such as toluol and then thinned or cut with any one of the above named solvents, advantageously, butyl acetate, due to the fact it is cheaper than some of the other solvents, and alcohol. This thinner may comprise, for example, 60% toluol, 30% butyl

acetate, and 10% alcohol. The cellulose thus cut is preferably of liquid or semi-liquid form, and a suitable abrasive in divided form is mixed with or dispersed through the binder. It is thought to be best that the mass, containing the binder and abrading material, be of fairly thick consistency or substantially of a semi-fluid nature, so as to tend to more or less adhere to the article to which it is applied in the form of a rather thick coat.

The mix is applied to the body material and preferably adheres thereto in the form of a relatively thick coating and then allowed to dry. One way in which the material may be applied to the body is by dipping the fabric into the mix or by running the same through the mix. The accompanying drawing shows, more or less diagrammatically, one manner of applying the nitrocellulose and abrading material mix to the fabric body, and the drawing also shows views designed to illustrate the nature of the finished article.

Fig. 1 is a diagrammatic view of apparatus for making the article.

Fig. 2 is a plan view of a drying frame.

Fig. 3 is an enlarged view with part cut away showing the nature of the finished article.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3.

Fig. 5 is a face view of an article useful for abrading or scouring purposes, as above pointed out.

In the drawing, the fabric body is illustrated at 1 and it may be in strip form wound in a supply roll as at 2. This strip of fabric may be drawn through a slot 3 and into the nitrocellulose and abrading material mix 4 contained in a tank 5. The strip may be guided by rollers 6 and 7 and under the surface of the material. The tank is perfectly closed by a cover 8. The strip may be directed upwardly and may be passed between scraping dies 9 and 10, and one of these scrapers may be spring-pressed by means of a spring 11. Preferably the scraping action is light so as to remove excess mix but allowing a considerable thickness of coating to remain upon the fabric. The coated fabric may be drawn out of the tank through slot 12, passed over a support or roller 13, and directed over a work table 14. A frame 15 may be laid upon the table and the frame may be provided with a multiplicity of upstanding pins 16. The strip with the wet coating material may be fastened to this frame by pushing the same over the pins so that it is held taut. The material may now be severed substantially at the point A

and the frame with its length of material stretched thereon hung up to dry, for which purpose the frame may have a supporting device 17. The drying process may be done in the open atmosphere, or, if desired, may be accelerated with the use of any suitable drying apparatus. This structure shown in Fig. 1 merely exemplifies one way of treating the fabric, although the article may be made by improved and more automatic apparatus.

One type of fabric is illustrated in the cut-away portion of Fig. 3, wherein the fabric is shown of open construction, and as shown, has a coating 20 applied thereto, this coating also appearing in Fig. 4. Where a fabric of such open work structure is provided the coating may not completely fill all the interstices, as illustrated. For some scouring, rubbing or abrading purposes, units such as illustrated in Fig. 5 may be cut from the pieces when dry. The frames 15 may be of any desired length so that the number of units may be cut therefrom, and advantageously, the original strip has selvage edges so that the articles will not ravel at least on two edges. However, the edges of the strip of fabric may be otherwise provided to prevent raveling.

It is to be appreciated, of course, that any suitable abrading material may be employed with varying degrees of coarseness or fineness to fit the particular use to which it is to be put. Pumice, carborundum, sand, or other abrasive materials may be used. For coarse work, coarser abrasive may be used and for fine work finer abrasive may be used. The weave of the fabric may be of relatively fine weave for fine work and of relatively coarse weave for rough or coarse work. In many industries metal articles are sanded or rubbed with sandpaper or the like in the presence of water or other liquid, this being the so called wet process as mentioned above. Articles made in accordance with this invention may be used in place of sandpaper for these purposes.

In order to further exemplify the invention, it may be stated that articles have been made having a cellulosic binder employing pumice as the abrading material, the same being deposited upon an underlying fabric body and appearing much as illustrated in Fig. 3. When the coating is dry the finished product is quite stiff or rigid, although not brittle. When the finished product, however, is subjected to water the same becomes quite flexible and can be used with or without soap for the scouring or scrubbing of pots, pans, wash bowls, sinks, and other household uses, as well as for commercial uses. The non-soluble binder, namely, the cellulosic material, remains attached to the fabric, and it appears that the scrubbing or wiping action frees the abrasive. It also appears that the softening of the product by being wetted with water is caused by reason of the water penetrating through the coating and wetting the underlying fabric. The coating does not seal the fabric in a waterproof manner since the coating

may not completely enter all the interstices; even the coating on the exposed surfaces is not necessarily waterproof as no attempt is made to obtain a compact imperforate coating; then again, the presence of the abrasive in the coating breaks up the continuity of the cellulose. All these things appear to contribute to the action of the water wetting the underlying fabric. In some of the claims appended hereto reference is made to the "imperfect continuity" of the coating. This is to be construed as descriptive of a coating through which water or other liquid may pass to wet the fabric, whatever be the cause of the porosity, non-uniformness or non-waterproof nature of the coating. After use the article may be allowed to dry and can be used over and over a number of times.

I claim:

1. An abrading article for wet rubbing operations comprising, a fabric base and a dry coating on the base comprising a body of cellulose ester with divided abrading material dispersed through the cellulose ester, said cellulose ester serving as a vehicle for the abrading material and serving as an adhesive for holding the coating to the fabric base, said coating substantially uniformly covering the fabric base and being of imperfect continuity, whereby water or other fluid may pass through the coating and wet the fabric and render the article flexible for rubbing operations, said cellulose ester adapted to free the abrading material incident to rubbing action.

2. An abrading article for wet rubbing operations comprising, a woven cloth base with relatively large interstices, and a dry coating on the base comprising a body of cellulose ester with divided abrading material dispersed through the cellulose ester, said cellulose ester serving as a vehicle for the abrading material and serving as an adhesive for holding the coating to the fabric base, said coating substantially uniformly covering the fabric and filling into the interstices, said coating being of imperfect continuity, whereby water or other fluid may pass through the coating and wet the base and render the article flexible for rubbing operations, said cellulose ester adapted to free the abrading material incident to rubbing action.

3. An abrading article for wet rubbing operations comprising, a fabric base and a dry coating on the base comprising, a body of nitrocellulose with divided abrading material dispersed through the nitrocellulose, said nitrocellulose serving as a vehicle for the abrading material and serving as an adhesive for holding the coating to the fabric base, said coating substantially uniformly covering the fabric base and being of imperfect continuity, whereby water or other fluid may pass through the coating and wet the fabric and render the article flexible for rubbing operations, said nitrocellulose body being adapted to free the abrading material incident to rubbing action.

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