Dec. 8, 1942. A. E. BOLLINGER 2,304,071

SANDBLAST BOOTH

Filed Nov. 25, 1938

Fig. 1.

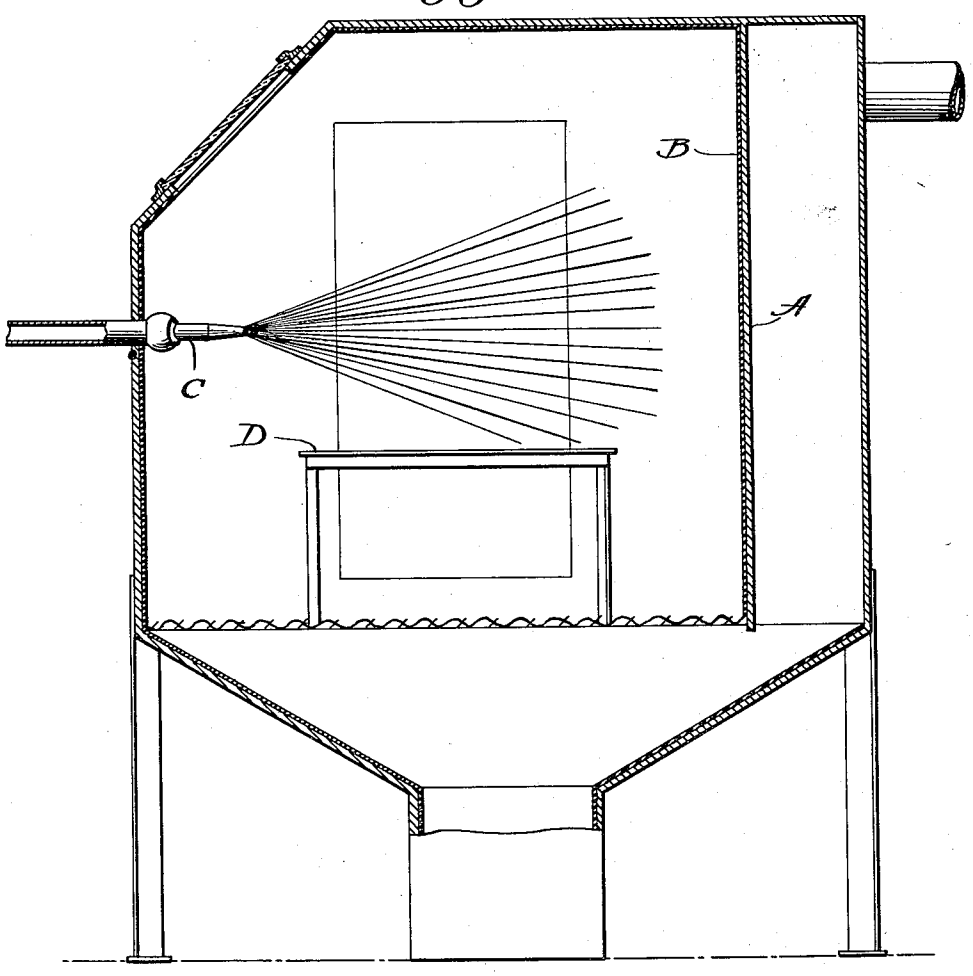


Fig. 2.

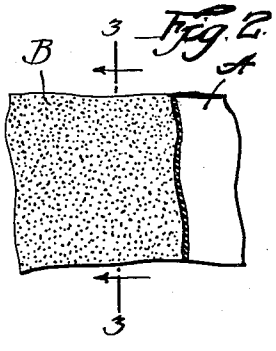
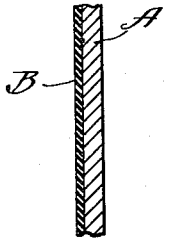


Fig. 3



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SANDBLAST BOOTH

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6 Claims. (Cl. 51—8)

The present invention relates to improvement in structures and especially to those adapted for use as sandblast booths or the like.

Sandblast booths or abrasive scouring devices are used in large numbers in foundries, galvanizing plants, sheet metal plants, etc. They are also used in plants which make bottles and in the glass factories where etching is done. In bottle plants such devices are used in cleaning molds, for example. These are merely illustrative of the uses of so-called sandblast booths.

In an illustrative use of sandblast booths, a metal or other article to be scoured or etched may be placed upon a suitable support inside of the booth so that abrasive particles will be directed against or will scour the article as desired. A usual type of sandblast booth is equipped with a nozzle which makes it possible to train a stream of abrasive particles against surfaces of the object to be polished or scoured. For such devices to work efficiently over an extended period of time, it is desirable for the sharp edges of the abrasive particles to be protected as much as possible because, as will be obvious, a dull abrasive will not perform efficiently in a scouring or abrading operation. In particular it is desired to avoid dulling of the abrasive particles when they come into contact with the inside walls of the booth. It is also desired to have the booth dust-tight or as nearly dust-tight as possible.

I am aware that suggestions have heretofore been made that a rubber sheet be attached to the inside walls of booths or to portions of the inside walls thereof. This has not proved very satisfactory for various reasons. The rubber sheets invariably come loose after a brief period of use and tear away from the walls which they are supposed to cover. When the sandblast booth is thus in the hands of the user, and ordinarily far away from the plant where it was made, the usual thing is to simply discard the rubber sheet and not to attempt to reattach it to the balls of the booth. This results in a very inefficient use of abrasive and also normally occasions the escape of abrasive dust from the booth which is injurious to human health and tends to cause silicosis. Under the extremely high velocity of abrasive particles in the interior of the booth, a rubber sheet which is not tightly attached to the wall which it is supposed to cover will quickly deteriorate or have pieces torn therefrom.

I have discovered that sandblast booths may be greatly improved by coating interior surfaces thereof with a rubber cement, which may be of a type as hereinafter illustrated. The interior walls of sandblast booths are ordinarily made of metal, although they may be made of wood or other materials.

It is an object of this invention to provide a sandblast booth or abrasive polishing device having interior walls of such character that dulling of the abrasive will be minimized or avoided. It is a further object of this invention to provide a sandblast booth which is substantially dust-tight. Another object of this invention is to provide a sandblast booth or the like having walls comprising metal or other material to which there is joined an adherent, resilient coating of material, the coating being of such nature that it will tenaciously adhere to the walls even under the scouring action of abrasive grains moving at high speed. These and other objects and advantages will appear fram the description taken as a whole.

To illustrate structural embodiments of the present invention, reference is had to the accompanying drawing in which:

Fig. 1 shows a sandblast booth;

Fig. 2 is a broken-away detail of a portion of the structure shown in Fig. 1;

Fig. 3 is a sectional view taken on 3—3 of Fig. 2.

Referring more in detail to the drawing, in which like reference characters denote similar parts, wall A (which may be made of steel, alloy metal, or other material) is coated on the inner surface thereof with a layer or film B of a rubber cement. As will be seen, this rubber cement layer B coats virtually the entire interior surfaces of the booth, including top and bottom walls thereof. The areas where a layer of rubber cement is most desirable or necessary are those directly opposite the jet C, from which "sand" is emitted at high velocity. While the term "sand" is used, this is simply used in a conventional or generic sense to include any desired type of abrasive which will be selected in accordance with the articles being polished, sccured or etched. Articles to be scoured may be placed upon the support D.

While cements having the desired combination of properties, including hardness, adhesion, resistance to flow and a certain minimum compressibility, may be used to provide the layer or coating B, rubber cements which I have discovered to be advantageous are illustrated by the following examples.

Example 1

Whole tire reclaimed rubber	pounds	300
Wood rosin	do	300
Asphalt	do	450
Asbestos fiber	do	150
Hydrocarbon solvent	gallons	200

The asphalt employed has a melting point (ball and ring method) of approximately 190° F. It was a steam and air refined Mid-Continent residual petroleum asphalt. The asbestos fiber employed was the Canadian Government Standard E7–D, although various asbestos or other fibers may be employed. The hydrocarbon solvent used was derived from petroleum and had a specific gravity of 0.70, an initial boiling point of 140° F. and an end boiling point of 210° F. It will be understood that other asphalts and other petroleum solvents than those particularly mentioned may be employed. Likewise other rubber besides whole tire reclaimed rubber may be used and the wood rosin may be replaced in whole or in part by other suitable resins or other abietates.

The ingredients of the above example may advantageously be compounded as follows. The whole tire reclaim may first be softened and warmed by mixing the same on a two-roll rubber mill. The resulting softened reclaim may then be transferred to an internal mixer, for example of the Werner-Pfleiderer type. The rosin and asphalt may then be added in small portions while continuing the mixing of the ingredients until a smooth, uniform mixture is obtained. The asbestos fiber may next be added and the mixing continued until the fiber is thoroughly dispersed throughout the mass. The petroleum solvent may now be added and the mixing continued until the mass is smooth and uniform. The resulting cement may be applied to the metal or other walls of a sandblast booth or the like in any desired manner. It will tenaciously adhere to steel and other metal walls, to which adhesion is difficult, and will not run off even when applied in layers or coatings ⅛ inch thick or more.

An even better cement for this purpose, from a number of angles, is the following:

Example 2

Whole tire reclaimed rubber	pounds	300
Asphalt	do	300
Limed wood rosin	do	300
Asbestos fiber	do	125
Denatured ethyl alcohol	do	50
Petroleum solvent	gallons	175

The ingredients of Example 2 may, for example, be compounded in accordance with the procedure illustrated in connection with Example 1. The particular asphalt, asbestos fiber and petroleum solvent used in Example 2 may be similar to or different from that described in connection with Example 1. The limed wood rosin may, for example, comprise a fused calcium rosinate containing approximately 7% of lime.

The cement of Example 2 differs from that of Example 1 in that:

(1) Limed rosin is used instead of ordinary rosin;

(2) The asphalt content is slightly lower in Example 2; and

(3) Alcohol is used in Example 2 and serves to make possible a higher solid content of the cement while maintaining a given fluidity.

(4) Its acid number is much lower and may be between about 30 and 5, e. g. 10, 15 or 20.

While the cement of Example 1, when applied as a coating material to the inside walls of sandblast booths, represents an important improvement over types of constructions heretofore employed, the cement of Example 2 is, in the average case, still more advantageous than that of Example 1. For example, the cement of Example 2 is a faster drying cement and one which dries to a non-tacky surface quickly. The cement of Example 2, in its final dried film form, possesses greater resistance to abrasion than does the final dried film of Example 1.

Though it is most often desired to use these cements in the coating of metals, to cover surfaces thereof and to provide an adherent, protective and resilient coating therefor, they may also be used to provide a coating or covering for wood or other materials.

It will be understood that the specific examples given above, while they represent cements which can advantageously be used for purposes of this invention, are merely illustrative and not limitative. In place of the particular rubber mentioned, other types of rubber and/or other types of reclaim and/or other rubbery substances may be used. Likewise, in lieu of the particular asphalt mentioned, other suitable asphaltic or bituminous materials may be employed. It will be understood that wood rosin and limed wood rosin are mentioned because these materials represent the most commercially available resins or resinates which are suitable for this purpose, though other resins and resinates could be used.

The asbestos fibers serve to give the cement wet strength and to hold the same in place during the setting period.

Since an important function of the ethyl alcohol is as a viscosity reducer, it will be obvious that other viscosity reducers may be employed. Likewise it will be understood that the suitable cements are not limited as to any particular solvent. Cements generally are contemplated which have good adhesion to the surface to be coated and which present a high resistance to abrasion and have a suitable resiliency. While, by the discussion given, I do not propose to limit myself to cements comprising rubber and asphalt, yet within the rubber-asphalt class of cements those which do not contain an appreciable amount of rubber or the equivalent normally have relatively poor resistance to abrasion. On the other hand, cements which have been prepared using only reclaimed rubber and rosin, without any asphalt, while useful, were not nearly as advantageous in the construction of sandblast booths or the like as is a cement such as that illustrated in the example last given.

Cements having still different compositions may be employed whether they possess the ingredients of the above examples or not, although they are preferably chosen so as to provide the characteristics as above pointed out.

While I have endeavored to point out preferred and advantageous methods of carrying out my invention, advantages of the teaching hereby provided may be realized to a substantial degree although the preferred illustrations of this invention are departed from. Likewise, while I have illustrated my invention largely in connection with sandblast booths, scouring devices and the like, it will be understood that it has a broader application in providing protective surfaces, avoiding abrasion and so forth.

All embodiments and variations coming within the scope of the appended claims are contemplated.

What I claim is:

1. A substantially dust-tight sandblast booth whose interior surfaces are coated with a continuous or substantially continuous, adherent resilient coating of the dried residue of a rubber

cement comprising reclaimed rubber and a resin, said coating being at least approximately one-eighth (⅛) inch thick, having a substantially non-tacky exposed surface and maintaining its adhesion to the underlying surface of said booth and resisting tendency to tear loose therefrom under intense and protracted bombardment by abrasive grains of high velocity.

2. A sandblast booth, comprising metal walls, whose interior metal surfaces are coated with a continuous, adherent coating of the dried residue of a rubber cement comprising rubber, asphalt and rosin dispersed in a volatile vehicle, said coating being resilient and having a hard and substantially non-tacky exposed surface, and being of such character as to maintain its adhesion to underlying surfaces of said booth and resist tendency to tear loose therefrom under intense and protracted bombardment by abrasive grains, said booth minimizing the dulling of abrasive particles and preventing escape therefrom of silica and other abrasive dust during use.

3. A substantially dust-tight sandblast booth whose interior surfaces are coated with a continuous or substantially continuous. adherent resilient coating of the dried residue of a rubber cement, said coating having a substantially non-tacky exposed surface and maintaining its adhesion to the underlying surface of said booth and resisting tendency to tear loose therefrom under intense and protracted bombardment by abrasive grains of high velocity, the aforesaid rubber cement being approximately as shown by the following formula:

Rubber	pounds	300
Rosin	do	300
Asphalt	do	450
Comminuted fiber	do	150
Hydrocarbon solvent	gallons	200

4. A sandblast booth, comprising metal walls, whose interior metal surfaces are coated with a continuous, adherent coating of the dried residue of a rubber cement, said coating being resilient and having a substantially non-tacky exposed surface, and being of such character as to maintain its adhesion to underlying surfaces of said booth and resist tendency to tear loose therefrom under intense and protracted bombardment by abrasive grains, said booth minimizing the dulling of abrasive particles and preventing escape therefrom of silica and other abrasive dust during use, the aforesaid rubber cement being approximately as shown by the following formula:

Reclaimed rubber	pounds	300
Asphalt	do	300
Limed rosin	do	300
Asbestos fiber	do	125
Denatured ethyl alcohol	do	50
Petroleum solvent	gallons	175

5. A substantially dust-tight sandblast booth whose interior surfaces are coated with a continuous or substantially continuous adherent and coherent resilient coating of the dried residue of rubber cement, said cement comprising rubber and a compatible resinous softening agent therefor, said coating having a substantially non-tacky exposed surface and said resinous softening agent being present in sufficient proportion in relation to the said rubber, in the rubber cement adjacent said underlying surface, so that said coating maintains its adhesion to said underlying surface of said booth and resists tendency to tear loose therefrom under intense and protracted bombardment by abrasive grains, said booth minimizing the dulling of abrasive particles and preventing escape therefrom of silica and other abrasive dust during use.

6. A sandblast booth comprising metal walls whose interior metal surfaces are coated with a continuous adherent and coherent coating of dried residue of rubber cement, said cement comprising rubber and a compatible resinous material including a bitumen, said coating being resilient and having a substantially non-tacky exposed surface, and said resinous material being present in sufficient amount in relation to said rubber, in the cement in contact with said metal surfaces, so that said coating will maintain its adhesion to said metal surface of said booth and resist tendency to tear loose therefrom under intense and protracted bombardment by abrasive grains, said coating as a whole being strongly coherent as well as strongly adherent, said booth minimizing the dulling of abrasive particles and preventing escape therefrom of silica and other abrasive dust during use.

ALLAN E. BOLLINGER.