Patented June 5, 1934

1,961,863

UNITED STATES PATENT OFFICE

1,961,863

MANUFACTURE OF BRAKE LININGS

Humphrey F. Parker, South Bend, Ind., assignor to Bendix Brake Company, South Bend, Ind., a corporation of Illinois

No Drawing. Application May 17, 1930, Serial No. 453,384

2 Claims. (Cl. 91—70.2)

This invention relates to brake linings for automobiles and similar vehicles.

At present the materials generally used for this purpose contain asbestos as a basic constituent together with a binding material. Usually the lining is a heavy woven fabric of asbestos cotton and brass wire, impregnated with rubber, wax, or other plastic material. All such linings are materially affected by heat.

A brake at times is liable to reach temperatures of five-hundred degrees Fahrenheit or more. It is known that cellulose commences to undergo chemical change at three hundred and twenty degrees Fahrenheit, and is therefore unsuitable as a brake lining constituent, and that only materials not affected by the highest temperatures liable to be encountered in the brake can be expected to give uniform performance. This excludes the use of most organic compounds except bakelite, which has been tried with moderate but not complete success.

In the present invention asbestos is used as the basic material and is held together with a metallic binder. To get the two materials into the necessary close association the asbestos is heated to drive out moisture and to destroy organic matter, the metal is then applied to the asbestos in the molten state, and the excess is afterward squeezed out. The metal used must be relatively soft to avoid scoring the brake drums, and should melt at a relatively low temperature, to facilitate manufacture. Lead is therefore proposed for the purpose, but it should be understood that other metals or alloys may be employed without departing from the invention.

The asbestos used may be either loose or woven. In the latter case a very heavy asbestos fabric is prepared, with or without brass or other wire but without cellulose. This fabric is made up in the form of a roll, which is immersed in a bath of molten lead. After impregnation of the fabrice by the lead has taken place, it is passed through rolls under heavy pressure. Most of the lead is forced out and the material that remains is simply asbestos with a small quantity of lead filling the interstices.

While the sheets that go through the rolls are preferably narrow, it is not necessary that they be the exact size of the finished lining, for the material, held together by the metallic binder, may be trimmed as desired regardless of its weave. The asbestos must be freed of oxygen or air before immersion, as otherwise lead oxide would tend to form about the asbestos and retard or prevent impregnation.

One method of accomplishing this is to place the rolls of asbestos in a closed chamber and to exhaust the air from the chamber, and then to admit nitrogen until the atmospheric pressure is restored, when the fabric may be removed for impregnation. Appropriate steps should be taken to prevent oxidation of the lead bath, and to prevent impurities reaching the fabric.

When "loose" asbestos is used, similar precautions must be taken to remove oxygen associated with the asbestos, and steps must be taken to ensure immersion, since the asbestos would tend to float on the surface of the molten metal. After impregnation surplus metal is removed between rolls or presses. Finishing operations may of course be carried out after a reheat if so desired.

Another inorganic substance which may be used as a binding material is sodium silicate. In this case as before the asbestos may be either woven or loose, and after impregnation with the liquid, is subjected to pressure to drive out surplus liquid and to consolidate it. It is then placed in an oven and baked.

Having thus described the various features of the invention, what I claim as new and desire to secure by Letters Patent, is:

1. A method of manufacturing brake lining which comprises heating asbestos to expel moisture and to destroy organic matter therein, applying molten lead to the asbestos to fill the interstices thereof, and removing the excess lead by pressure.

2. A method of manufacturing brake lining which comprises heating asbestos to expel moisture and to destroy organic matter therein, applying molten lead to the asbestos in the presence of an inert gas to fill the interstices of the asbestos without oxidizing the lead, and removing the excess lead by rolling the resulting product under pressure.

HUMPHREY F. PARKER.