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METHOD OF MAKING BRAKE LININGS.

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This invention relates to the making of friction elements, particularly brake lining for motor vehicles, and has for an object to provide a method of making improved brake lining which will reduce to a minimum the "squeal" of the brakes.

It is also an object of the invention to reduce the tendency of the brake lining to grab, and thus gives a smoother and more uniformly acting lining.

It is a further object of the invention to produce a brake lining having a less tendency to bleed than the linings now commonly in use, and to also reduce the tendency to score the drums.

It is a further object of the invention to reduce the tendency to binding and abrasion of the yarn in the process of weaving, and thus reduce to a minimum the present difficulties which give trouble in weaving.

With the foregoing and other objects in view, my invention consists in a novel method of making brake linings and similar friction articles which will be more fully disclosed as the description proceeds. The invention consists broadly in moistening the yarn used for weaving the brake lining or friction element with a suitable liquid, such as gasoline, kerosene, water and so forth. Very satisfactory results have been secured by using water. Such a liquid as is used is not intended as a permanent saturant for the brake lining but is intended only as a carrier for the carbon and is later evaporated. After the yarn is thoroughly moistened the surface is covered with a coating of powdered carbon, such as graphite or charcoal. This coated yarn is then woven into the brake lining, and the woven lining is then saturated with a suitable liquid binder and cured by any of the known methods, as by the application of heat or of heat and pressure. In the event the liquid used is water it ordinarily is dried out or evaporated before the lining is treated with the permanent saturant. If kerosene or gasoline and similar liquids are used they may be evaporated either before or in the curing process.

In a specific operation which has been employed a tube or a spool of filling yarn, such for example as asbestos yarn or yarn composed of asbestos and sufficient cotton to give the required strength, was immersed in some suitable liquid, such as gasoline, kerosene or water and so forth. After the spools of yarn were thoroughly saturated they were taken to the cop winder for winding the filling for the loom shuttles. The wet spools of yarn were placed on the cop winder stand and the yarn led down into a vessel containing dry powdered carbon, such as graphite or charcoal, passed under a bar or other suitable guide at the bottom of this vessel, and then up and out into the winder head where it was wound into cops for the filling. On its passage through the dry powdered carbon the wet yarn picked up a continuous coating of this carbon. The coated filling yarn was then placed in loom shuttles and woven into brake lining in the usual manner. The lining was then saturated with a suitable liquid binder and cured by the application of heat or heat and pressure.

The lining produced by this method has practically no tendency to "squeal", and it will be apparent that the method is a very simple one and is not an expensive process to use. The application of the carbon to the yarn before it is woven introduces the carbon into the very body of the lining, and therefore, the treatment is not a mere surface treatment of the lining which soon wears off, but is a uniform treatment throughout the entire body of the lining. This treatment also reduces the tendency of the lining to grab the drum, thus giving a much smoother action, and it reduces the tendency to score the drum. The carbon, especially the charcoal, absorbs the excessive saturant used in the curing of the lining and thus reduces the tendency of the lining to bleed. It, therefore, prevents gumming up of the drum.

Another important advantage of this method is that the carbon on the surface of the yarn reduces or practically eliminates the drag on the yarn in the weaving, particularly as the yarn passes through the guides on the shuttles. In other words it reduces the tendency to binding or abrasion of the yarn in the process of weaving. In weaving, even a slight tendency to drag causes trouble, particularly in the case of asbestos yarn which does not have great tensile strength, and it will be seen that this surface coating of carbon facilitates the freer passage of the yarn through the guides, thus reducing the tendency of the yarn to drag.

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Having thus set forth the nature of my invention, what I claim is:

1. A method of making a brake lining which comprises moistening a yarn, passing the wet yarn through powdered carbon whereby it picks up a coating of this carbon, weaving the yarn into a lining, saturating the lining with a suitable binder, and curing with the application of heat.

2. A method of making a brake lining comprising moistening a yarn, applying powdered carbon to the surface of the moistened yarn, weaving the yarn into a lining, saturating the lining with a liquid binder, and curing.

3. A method of reducing the tendency of a woven yarn brake lining to squeal, bleed, and grab and score the drum, which comprises applying to the yarn before it is woven a coating of powdered carbon, weaving the coated yarn into a lining, saturating the woven lining with a liquid binder, and curing.

In testimony whereof I affix my signature.

SAMUEL HUGHES.

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