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BRAKE LINING AND METHOD OF MAKING SAME

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This invention relates to brake lining as generally applied to automobile brakes and the process of making the same, and has as a particular object the production of a lining which will not freeze to the brake drum when wet and which retains its high coefficient of friction for braking purposes. At the present time considerable trouble is experienced, and also considerable damage is done, by entrance of moisture into the brake or brake band and later freezing in cold weather when the car is left standing with the brakes applied, so that the band or lining freezes to the metal drum. It is then, of course, impossible to start the car without first releasing the band from the drum, or, if an attempt is made to start the car, the rear axle or other mechanism may be broken. Numerous attempts have been made to overcome this difficulty but without success until the present time. I have found that by treating the brake band with a solution containing sufficient glycerin that it will be retained in such a quantity by the band as to leave by its contact an enduring film of glycerin on the surface of the brake drum, it will diminish the force of adhesion between ice and the drum and the band will not freeze to the drum. Glycerin will mix with water in almost any proportion and the mixtures of glycerin and water have a lower freezing temperature than 32° F. or the normal freezing temperature of water, and the greater the proportion of glycerin in the mixture the lower will be the freezing point. This thin film of glycerin adjacent the surface of the drum mixes with the moisture should any enter the brake and forms a film next to the surface of the drum which has a very low freezing point, and therefore, the band cannot freeze to the drum in temperatures which are ordinarily encountered in most climates.

In actual practice asbestos brake lining has been immersed for from one to five minutes in a mixture of glycerin and water in various proportions from 12½% glycerin and 87½% water to 50% glycerin and 50% water, and then after pouring water through the brakes the brake has been subjected to a temperature of 5° below zero for an hour, and in all cases the band did not freeze to the drum but easily freed itself when the brake was released, although the lining treated with the solution having the higher proportion of glycerin was freed somewhat more readily than the lining treated with the lower proportions of glycerin. I am, therefore, uncertain as to the exact limits for the relative proportions of glycerin, but it is believed that practically all proportions would have some freeing effect depending somewhat on the temperatures in which the brakes are to be used. However, the larger amount of glycerin is preferable because as water enters the brake some of the glycerin may be washed away and some of the glycerin may be lost in severe use of the brake.

In applying the glycerin to the brake band or lining, it may be applied to the fibre or yarn or untreated tape or sheet from which the lining is made, or it may be applied to the completed lining, and the material is treated a sufficient length of time to cause some penetration of the glycerin into the lining, although it is not necessary that there be a complete impregnation or saturation. The glycerin may also be applied by mixing it with the saturant binder or compound with which the fibres of the lining are treated in the manufacture of the lining. It is believed that from about 1% to about 10% of glycerin in the saturant or compound are the proportions which would give the desired results, although of course, I do not wish to be limited to these proportions. Thoughout the specification and claims the term "impregnated" does not necessarily means completely saturated.

The effect is secured because of the peculiar properties of glycerin. In the first place the glycerin in small quantities does not decrease the efficiency of the brakes. In other words it does not decrease the coefficient of friction, and tests even seem to indicate that it increases the efficiency of the brakes. Second, it cannot be vaporized by the temperatures ordinarily induced by use of the brake. Third, its freezing or congealing temperature is very low and, fourth, it mixes with water in all proportions, and all of these mixtures having a freezing temperature below the nor-

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mal freezing temperature of water, and therefore, by its use we always have a film of a lower melting and a lower freezing temperature between the band and the drum. That is, glycerin has the peculiar property that in small quantities or in a thin film it does not decrease the efficiency of the brake, and it forms a mixture with water having a low freezing point.

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

1. A brake lining comprising an impregnated fibre body treated with glycerin.

2. A brake lining composed of a suitable fibre impregnated with a saturant containing glycerin.

3. A brake lining comprising asbestos fibre and treated with glycerin.

4. The process of preventing freezing of a fibre brake lining to its drum in cold weather which consists in treating the fibre with a liquid containing glycerin a sufficient time to cause some penetration of the fibre by the glycerin.

5. A brake lining comprising a fibre tape treated with glycerine.

6. A brake lining composed of a tape comprising asbestos fibre and treated with glycerine to cause some penetration of the fibre by the glycerine.

In testimony whereof I affix my signature.

FREDERICK C. STANLEY.

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