

ALIEN PROPERTY CUSTODIAN

FRICION MATERIAL

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the Alien Property Custodian

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This invention relates to a friction material of the type used for friction brakes and friction couplings.

As is well known brake blocks of metal, for example, of cast iron, do not have a sufficient braking effect at very high speeds.

On the other hand brake blocks of resilient non-metallic material, for example, synthetic substances on artificial resin basis, leather, rubber and the like, whose braking effect is not reduced so much with increased speed as that of metallic brake blocks, have the severe drawback that they are burnt or otherwise destroyed by the very high temperatures produced in the brake lining by the friction. I have found that brake linings of the said resilient materials are not satisfactory for high speed or high duty service.

It has been proposed already to make brake blocks, brake linings, coupling linings and clutch facings of artificial carbon material. This material offers the advantage that its coefficient of friction is not reduced with increasing speed as it is the case with brake linings of metal. Also the high resistance of the material to heat is highly desirable for the reasons above stated.

It will be understood that the artificial carbon material which has undergone a heat treatment at temperatures of 1000-1500° C. in its production is capable of standing very high temperatures in its use.

It has also been suggested already to admix mineral substances in the production of the carbon material in order to increase its friction. However, if such admixtures are added in quantities having the desired effect in respect to the braking characteristics of the material the strength of the artificial carbon material and its heat conductivity are affected. On the other hand, the mechanical strength is very essential for the use of the artificial carbon material in brake blocks and a relatively high heat conductivity is also required to lead off the heat which is developed in the braking action.

It is the object of the present invention to provide an artificial carbon material having high mechanical strength, high braking effect and high heat-conductivity characteristics.

With these objects in view, I incorporate metal

material in the plastic carbon mass which is then compressed and finally annealed at the temperatures used in the manufacture of artificial carbon material, for solidification.

The shape, size and quantity of the metal embedded in the carbon mass depends upon the special use for which the material is intended to be put. For example, steel turnings or chips of a very fine condition or, on the other hand, turnings having a thickness of several millimeters may be used. Also metal chips from planing, filing or sawing work may be used and different sizes or mixtures of different sizes and qualities may be used. Further, metal texture, metal netting, metal cords and strings or ribbons may be embedded in the plastic mass. I have found that such metal admixtures form a very intimate joint with the ceramic carbon material in the annealing operation.

My novel friction material when used for brake linings and the like, offers various advantages.

1. The braking properties of carbon and metal are combined. Owing to the different hardness of the two combined materials a surface polish is prevented which would reduce the braking effect at high speed. Mutual seizing or grinding of the associated active frictional surfaces of the brake block and on the brake drum is avoided.

2. The heat conductivity of the material is greatly increased by the metal admixtures. Heat is led off much more efficiently than by homogeneous artificial carbon material. The embedded metal pieces felt together and impart to the material an extremely solid and elastic structure. The metal pieces weld and melt together in the annealing operation whereby a metal skeleton is formed which is completely embedded in the carbon body. Sealing or bursting off of any parts of the brake lining is no more possible and the combined iron-carbon body is not liable to breakage.

The method and apparatus of the present invention have been described in detail with reference to specific embodiments. It is to be understood, however, that the invention is not limited by such specific reference but is broader in scope and capable of other embodiments than those specifically described.

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