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DRAWINGS ATTACHED

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C4X 4

(54) BRAKE OR CLUTCH LININGS

(71) We, KABUSHIKI KAISHA TOYOTA CHUO KENKYUSHO, a Corporation duly organized under the laws of Japan, of 2—12, Hisakata, Showa-ku, Nagoya-shi, Aichi-ken, Japan, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement: —

The present invention relates to an improved brake lining, clutch facing and the like (hereinafter called a lining).

The optimum properties required of a good lining are: an adequate coefficient of friction for expected usage, ability to retain a constant coefficient of friction under varying conditions such as rubbing surface temperature and pressure, and little wear or scoring on its own and on an opposed rubbing surface.

Conventional linings have not been adequate to fulfil the requirements for a desired lining as listed above. The friction materials forming said conventional linings are mainly composed of asbestos with one or more agents in amounts ranging from several percent to ten percent and higher, added for raising and stabilising the coefficient of friction and the wear resistance: for example, oxides, e.g. silicon dioxide and alumina; sulfates and sulfides, barium sulfate and lead sulfide, and heat resisting resins added as binders for subsequent compression, heating and molding. None of these conventional friction materials satisfy the described requirements because some have poor wear resistance although having stable coefficient of friction at high temperatures, and because others have poor or unstable coefficients of friction, although having good wear resistance. Other disadvantages of conventional friction materials are a decrease of coefficient of friction and reduction of braking force and a marked increase in wear at the high temperature of 200—300°C very frequently encountered in practical use.

[*Price 25p*]

It is a primary object of the present invention to provide an improved lining.

According to the invention, there is provided a brake or clutch lining comprising an organic binder and from 40 to 70% by weight of frictional force-imparting material selected from the group consisting of iron sand, iron powder, copper powder, asbestos and mixtures thereof, and from 2 to 25% by weight of a metal halide selected from the group consisting of cryolite, aluminum fluoride, calcium fluoride, magnesium fluoride, barium fluoride, copper iodide, lead iodide, lead chloride, and mixtures thereof.

Iron sand, so called Iserine, is a black sand which consists mainly of magnetic iron ore, or ferrosoferric oxide, Fe_3O_4.

When asbestos is used, a particularly strong friction material is obtained because of the bonding force thereof. When 20 to 50% by weight of iron sand, iron powder, or copper powder are mixed with the asbestos, an even, strong material of excellent quality is obtained. When iron sand, which is cheaper than asbestos, is added to the asbestos, a less expensive friction material is obtained.

The cost of fabrication of a brake or clutch lining in accordance with the invention is certainly not greater than, but usually far less than, that of fabricating conventional linings.

For organic binders, the material of the invention includes one or more kinds of conventional heat resisting resins, for example phenol aldehyde resins and modified phenol aldehyde resins. Adequate amounts of conventional fillers and additives are also used for the purpose of increasing the total amount of friction and to lessen fading.

The invention will become more readily apparent from the following detailed description of examples the test results of which are shown in the accompanying drawings, in which:

Fig. 1 is a diagram showing the relation