

- 12 The friction material of claim 11, wherein the synthetic fiber is polyester fiber
- 13 An asbestos-free and lead-free composition friction material, comprising, by weight, 1 4-3 5% synthetic fiber, 74-82% filler and 16-21% organic binder
- 14 The friction material of claim 13, wherein the synthetic fiber is glass fiber
- 15 The asbestos-free and lead-free composition friction material, comprising, by weight, 2 7-3 5% synthetic fiber, 74-82% filler and 16-19% organic binder
- 16 The friction material of claim 15, wherein the synthetic fiber is glass fiber

Description

This invention relates generally to composition type railroad friction materials and, more particularly, to such materials which feature the use of synthetic fibers and the absence of asbestos and lead

BACKGROUND OF THE INVENTION

Most of the composition type railroad friction materials in use today include asbestos and lead. An example of this type of material is shown in U S Pat No 3,168,487--Spokes et al. Some environmentalists have warned of possible problems caused by the use of lead in friction materials. As a result, demand has developed for a lead-free friction material. Examples of some composition friction materials which exclude lead are U S Pat Nos 3,492,262--Griffith and 3,959,194--Adelmann. The former patent discloses a composition which has no lead and includes up to 16 5% by weight asbestos fiber, while the latter patent discloses some compositions which delete lead and have up to 11 1% by weight asbestos fiber.

More recently, certain environmentalists have pointed out that possible problems may be caused by the use of asbestos fiber in friction materials. Thus, it may be desirable to eliminate asbestos as well as lead from composition friction materials. U S Pat No 3,959,194 has some examples which utilize cellulosic fiber in a range of 3 5-8 0% by weight as a substitute for asbestos, although the patent is not concerned with eliminating asbestos in friction materials.

Asbestos has traditionally been used in friction materials because of its high heat resistance and strength and its low cost. A direct substitution of other types of fiber for asbestos is expensive, since other fibers cost much more than asbestos, and difficult, since no known fiber combines all of the desirable qualities of asbestos noted above. It is known to use high-content carbonized or graphitized fibers in aircraft friction materials, as shown in U S Pat No 3,552,533--Nitz. The use of glass fiber in friction materials is disclosed in several patents. U S Pat No 3,743,069--Barnett relates a clutch facing consisting almost entirely of bundles of continuous glass filaments. U S Pat No 3,627,606--Bentz teaches a glass-filament-reinforced fabric clutch facing impregnated with a cement containing lead (litharge). U S Pat No 3,713,934--Morton discloses a clutch facing composed of glass and asbestos. None of these friction materials would be suitable for railroad brake shoe use, since they are either too expensive and/or contain lead or asbestos.

It is, therefore, an object of this invention to provide lead-free, asbestos-free, high coefficient of friction, composition friction materials which feature a low fiber content including synthetic fiber and low wear