Patented July 28, 1925. 1,547,408

UNITED STATES PATENT OFFICE.

EUGÈNE BUISSON, OF PARIS, FRANCE, ASSIGNOR TO SOCIETE ANONYME FRANCAISE DU FERODO, OF PARIS, FRANCE.

PROCESS OF MANUFACTURE OF FIBROUS AND SIMILAR PRODUCTS FOR FRICTION ELEMENTS OR FOR LIKE PURPOSES.

No Drawing. Application filed March 1, 1922, Serial No. 540,212.

To all whom it may concern:

Be it known that I, EUGÈNE BUISSON, a citizen of the Republic of France, and residing at Paris, Seine Department, No. 2 Rue de Chateaudun, in the Republic of France, have invented certain new and useful Processes of Manufacture of Fibrous and Similar Products for Friction Elements or for like Purposes, of which the following is a specification.

This invention relates to a process of manufacture of fibrous and similar products more particularly adapted for use as friction elements or for the construction of friction devices, clutches, brakes or the like.

At the present time there are employed in certain of these devices various friction elements (disks, bands and the like) which are constructed of pure asbestos woven with cotton and reinforced by metal wires. In these cases the friction surface alone becomes heated, this action being greater in proportion as the friction is greater and of longer duration; the cotton will become carbonized and the disk will assume the well known characteristic black color. According to the present invention this drawback is obviated by causing the fibrous material to become a good conductor of heat by the metallization of the fibres. The metal which is deposited upon the fibres, preferably by the galvanoplastic process, may in this case be sufficient to bind the fibres together and to insure the cohesion of the same, and where pure asbestos is employed, for example, it will not be required to weave the same with cotton; or where asbestos woven with cotton is employed, the cotton may be destroyed by calcination after the weaving and before applying the metal. In order to facilitate the application of metal by the galvanoplastic process, it will be advantageous to insert metal conducting wires in the fibrous material.

The present process can be applied in practice in the following manner:

Asbestos of pure quality, that is, not mixed with any foreign bodies capable of being carbonized when in use (cotton, for example), is prepared in the flaky state and is slightly moistened with distilled water; it is placed in any suitable molds having the form which is to be assumed later by the piece or object under treatment, such as disks or the like. Care is taken to incorporate into the pasty mass a light but rather closely woven gauze of copper wire (wire of 0.1 or 0.2 millimetre diameter at most). The said gauze will serve as the cathode during the metallizing operation. The meshes should have a sufficient size to insure a very close application of the metal deposit upon either side of the gauze.

The asbestos can also be woven in bands of the desired length and thickness, with or without cotton, by incorporating into the warp thread and the woof thread, one or more copper wires which has a sufficient section to act as conductors during the metallizing process. If cotton has been combined with the asbestos, the cotton will be destroyed by calcination after the weaving. The process is completed by a dipping of the fabric in order to attain the copper wires, and then by a thorough washing.

After suitable drying and a sufficient compression in order to obviate any loosening of the material during the galvanoplastic operation, the plate or band under treatment, woven or not, is immersed in the galvanoplastic bath and remains therein for the length of time required to produce a sufficient deposit of cobalt, copper or other suitable metal. This deposit is intimately fixed with the asbestos and is necessarily of a discontinuous nature, and it acts as the binding substance.

The said substance will be lighter and more effective according as the asbestos shall have been sufficiently compressed in the first place in order to form within the mass a network of small capillary ducts into which the metal deposit will infiltrate, proceeding from the wire gauze and attaining each side of the outer surface, and surrounding the threads of the material which is to be metallized. A thorough washing should evidently be given after removal from the metal depositing bath. After a sufficient drying, the substance can be pressed in suitable matrices in order to obtain the definite shape, size and thickness to be given to the object, such as a disk or the like. In this manner the material will become a relatively good conductor of heat and is capable of storing up a considerable quantity of heat by reason of the large surface of metallic copper and cobalt comprised therein.

Process of Manufacturing Fibrous and Similar Products for friction elements or for like purposes (US Patent 1,547,4... Published by AsbestosClaims.Law
ACL Doc 23469 · Page 1 of 2 asbestosclaims.law/library/23469/1

The waste matter which is produced by abrasion will obviously contain copper and cobalt, but the metal will be substantially in the colloidal state and will therefore be a bad conductor of electricity. It may be advantageous in certain cases to impregnate the material to be metallized with graphite; however, in order to avoid an unduly rapid and voluminous deposit of metal, this substance must be used with caution. To obviate dislocation of the material when in the galvanoplastic bath, it may be found necessary to inclose the article under treatment in a netting which possesses a considerable rigidity, and preferably of a non-metallic character (cellulose, for instance). The said netting can be subsequently destroyed by dissolving the same in a suitable bath.

A deposit of copper is preferably used for fabrics or agglomerates of asbestos which are subsequently to be subjected to a very high compression. Should it be desired however to maintain a certain degree of elasticity in the treated mass, a deposit of cobalt is greatly preferred. Cobalt is selected in preference to other metals by reason of the rapidity with which the deposit can be produced. The qualities of this metal are furthermore of great value for the manufacture of friction elements, such as disks and facing for friction clutches, brake bands, and the like.

Claims:

1. A process of manufacture of fibrous products having asbestos as a base for friction elements and like purposes, consisting of metallizing the asbestos fibres by the electro-plating method in order to connect the said fibres together and to provide for their cohesion, the metal being deposited in such a quantity that there is formed a solid block in which asbestos is uniformly distributed.

2. A process of manufacture of fibrous products having asbestos as a base for friction elements and like purposes, consisting of introducing into the asbestos mass a light openwork member made of a metal which is good conductor of electricity, of molding the said mass, of then metallizing the asbestos fibres by the electro-plating method in order to connect the said fibres together and to provide for their cohesion, the metal being deposited in such a quantity that there is formed a solid block in which asbestos is uniformly distributed.

3. A process of manufacture of fibrous products having asbestos as a base for friction elements and like purposes, consisting of molding under pressure asbestos fibres in the flaky state, of then metallizing the said asbestos fibres by the electro-plating method in order to connect the said fibres together and to provide for their cohesion and of subjecting lastly the block of the metallized fibres to a further compression in a mold.

4. Process of manufacture of fibrous products having asbestos as a base for friction elements and like purposes, consisting of surrounding by a non-metallic network of suitable rigidity, a block of asbestos, of then metallizing the asbestos fibres by the electro-plating method in order to connect the said fibres together and to provide for their cohesion, of destroying the network by dissolving the same and of subjecting the block so obtained to compression.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

EUGÈNE BUISSON.

Witnesses:
CAMILLE BEETRY,
MAURICE ROWE.