June 23, 1942. E. HAVERBECK 2,287,305

SEPARATOR FOR ELECTRIC ACCUMULATORS

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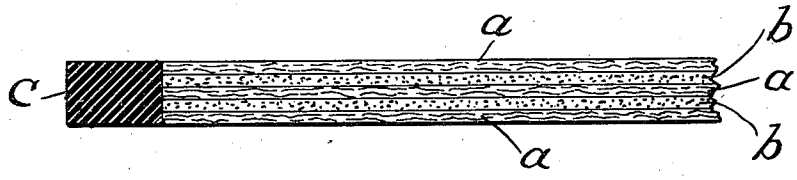


FIG. 1.

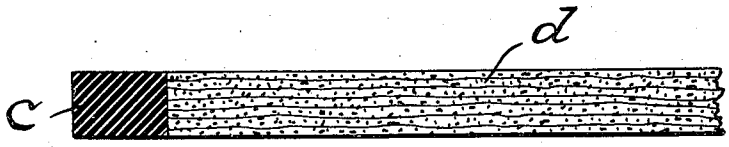


FIG. 2.

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SEPARATOR FOR ELECTRIC ACCUMULATORS

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1 Claim. (Cl. 136—146)

The present invention relates to a separator for electric accumulators, especially for those in starter batteries for motor cars, and to a method of manufacturing such separators. Previously in such batteries separators of glass wool have been used simultaneously in combination with wood separators. For this purpose a small wooden board was placed against the negative plate and a sheet of glass-wool against the positive plate. The glass-wool separator prevents loss of the active material or substance of a positive electrode in a particularly effective manner and, at the same time, protects the wood separator against injurious influences, especially those of nascent oxygen. The extractive substances contained in the wood separator serve at the same time to increase or keep constant the capacity of the negative electrodes.

This combination of a small wooden board with a glass-wool separator has, however, certain disadvantage inasmuch as the assembly operations are not so simple as when a single separator can be used. Besides, in the manufacture of the wood separator, there is a relatively greater wastage of valuable raw material, namely, of wood of special quality and origin.

These disadvantages are, on the basis of the present invention, obviated since the separator, while indeed likewise made of the materials glass and wood, constitutes a unitary structure. In accordance with this invention, the separator is a combination of glass-wool and particles of wood, whereby these materials are still arranged in alternate superposed layers or, on the other hand, are intermingled.

For a further exposition of the invention, reference may be had to the annexed drawing and specification at the end whereof the invention will be specifically pointed out and claimed.

The drawing shows to an enlarged scale two examples of the separator in which:

Fig. 1 is a cross-section of a separator having a laminated structure.

Fig. 2 is a cross-section of a separator in which the component materials, glass-wool and wood, are intermingled.

As may be seen in the example shown in Fig. 1, alternate layers *a* of glass-wool and layers *b* of wood particles are superposed. The wood particles may be composed of more or less fine wood dust but wood shavings or wood wool are particularly suitable as the wood shavings cling to each other and also to the adjacent glass-wool layers remarkably well. The edges *c* of the separator, according to the invention, are strengthened in a manner known per se either, for instance, by means of a layer of lacquer or by being provided with a special edging of soft or hard rubber.

In the design of separator illustrated in Fig. 2, the glass-wool fibers and small wood particles intermingle. In this case also wood shavings are used to advantage as they effect an especially good cohesion of the materials. The aforesaid strengthening or edge-binding *c* is conveniently used also with this type of separator.

The manufacture of the separators, according to the invention, is extremely simple. Depending on whether more or less thick glass-wool layers are used, on which the wood particles are strewn, either a stratified or laminated (Fig. 1) or a homogeneous (Fig. 2) structure of the separator is obtained. Should particularly thin glass-wool layers be used, then these will be entirely interspersed by the wood particles so that the completed separator has a homogeneous structure as indicated at *d* in Fig. 2.

In manufacture, in order to effect mutual cohesion of the construction materials, the separator is impregnated with binding materials such as glue or gelatin and, if necessary, pressure is applied. Rubber solutions may, however, also be used, especially those which produce a porous structure after vulcanization. Separators of any desired strength may be made by this means. The separator according to this invention comprises the advantage that wood waste may be used in its manufacture. Furthermore, the mounting of the separator in the plate assembly of the accumulator is extremely simple. While it is being well protected against the penetration or action of the active substance of the electrode plates, the separator according to this invention is distinguished by an especially low electrical resistance as compared with the double separators used up to now and mentioned at the beginning of this specification. Likewise, the favorable effect of the wood of the separator on the negative electrode plates is considerably increased through the surface of the wood particles being relatively great so that the extractive substances of the wood come into operation in an increased degree.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, claim is made as follows:

A separator for use in an electric accumulator comprising, glass-wool and wood particles intermingled and intermeshing one with the other and impregnated with a binding material to form a unitary structure, said wood particles ranging in size from dust to shavings and having constituents beneficial to the negative plates.

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