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Patented Jan. 28, 1902.

M. RAPHAEL & L. ELIAS.

INSULATING AND PACKING MATERIAL AND PROCESS OF MANUFACTURING SAME.

(Application filed Oct. 11, 1900.)

(No Model.)

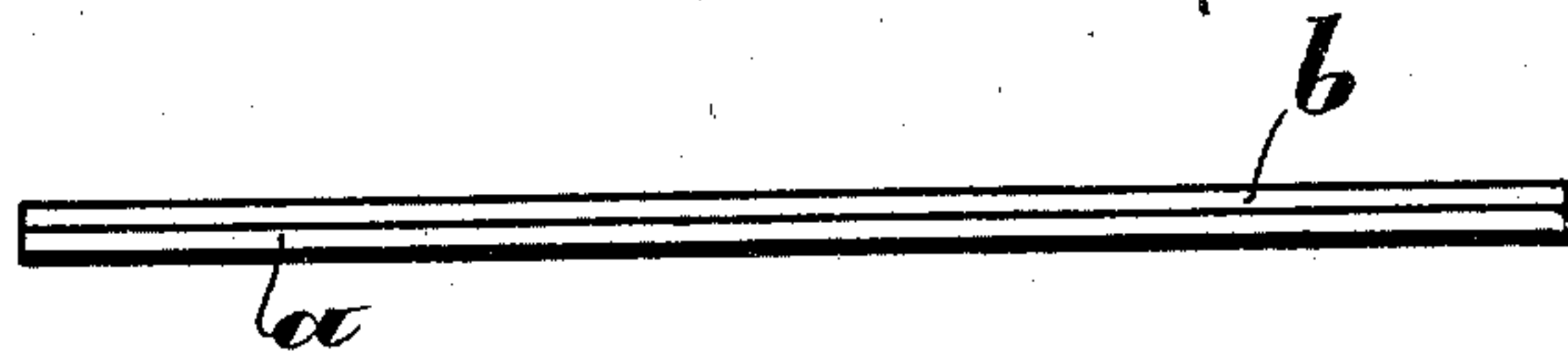


Fig. 1.

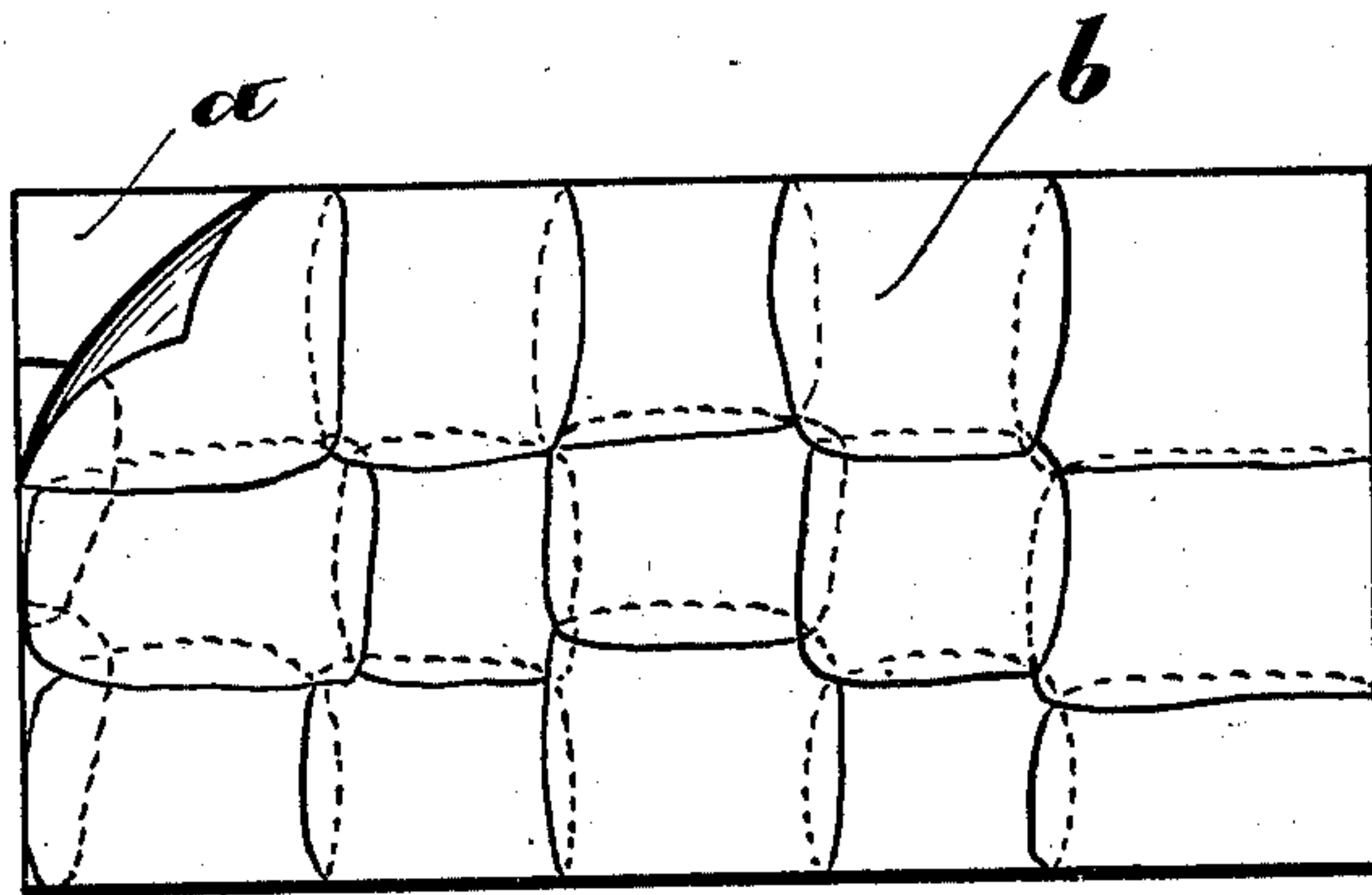


Fig. 2.

WITNESSES:

*Isabella Waldron*

*Otto Vinken*

INVENTORS

*Max Raphael*  
*Leopold Elias*

BY

*Richard H. [Signature]*  
ATTORNEYS

# UNITED STATES PATENT OFFICE.

MAX RAPHAEL AND LEOPOLD ELIAS, OF BRESLAU, GERMANY.

INSULATING AND PACKING MATERIAL AND PROCESS OF MANUFACTURING SAME.

SPECIFICATION forming part of Letters Patent No. 691,871, dated January 28, 1902.

Application filed October 11, 1900. Serial No. 32,723. (No specimens.)

*To all whom it may concern:*

Be it known that we, MAX RAPHAEL, manufacturer, of 10 Zimmerstrasse, and LEOPOLD ELIAS, manufacturer, of 37 Kaiser-Wilhelmstrasse, Breslau, Germany, have invented a new or Improved Insulating and Packing Material and Process of Manufacturing the Same, of which the following is a full and clear description.

10 This invention relates to a new or improved insulating and packing material and to the method or process of manufacturing same.

In the drawings, Figure 1 is an edge view 15 of the material, and Fig. 2 a plan view.

The improved material is particularly adapted for use as an electrical insulating medium. Hitherto mica has long been used as being the best insulating material for electrical purposes. Owing to the progress made in the electrical industry, such large quantities of mica are now used that the material is not only progressively rising in price, but it cannot be found in sufficient quantity in pieces 20 of a sufficiently large size, since in the natural condition mica very seldom occurs in large formed masses compared with the quantity found of a smaller form. Although small mica is found in sufficient quantity, yet it is only 25 capable of employment after having been brought by artificial means to such a condition as to present sufficiently large surfaces. For some time past a material known, particularly in Germany, as "micanit" has been 35 prepared as a substitute for the larger-sized pieces of mica. This substitute consists, essentially, of the smaller pieces of mica split into thin plates and caused to adhere together by means of dissolved shellac in such a manner as to constitute larger plates. Micanit, 40 however, possesses the disadvantage that the shellac employed becomes softened by the heat developed by the electric current, and, further, as very thinly split mica must be employed for the preparation of micanit the material contains too large a proportion of shellac. On the other hand, only thinly-split mica can be employed, as otherwise even and regular surfaces, such as are required for electrical purposes, could not be produced. 50

We aim by the present invention to over-

come the objection to the material known as "micanit" by rendering unnecessary the excessive use of an adhesive material, such as shellac. We prefer to dispense with adhesive material entirely; but we do not limit ourselves in this particular, as circumstances may arise where it will be desirable to use a preparation of adhesive material to augment the adhesion secured by pressure. 55 60

According to the present invention we utilize the property possessed by moistened asbestos of adhering rigidly to mica, so as to bind or unite the small pieces thereof together. The intimate union thus produced 65 remains even after the moisture has been removed.

In carrying out this invention the small thin plates or pieces of mica *b*, Fig. 2, are laid upon the asbestos *a*, and the latter is moistened with water. The mica pieces are laid 70 scale-like upon the asbestos, as shown in Fig. 2. Then the whole is subjected to pressure, whereby the greater proportion of the water is removed. By reason of the adhesion between the asbestos and the pieces of mica the latter are as firmly and rigidly bound together as the individual laminæ in the natural mica. Any moisture still remaining behind is removed by further pressing and simultaneously drying by application of heat or other suitable means, since it is obvious that an insulating material must contain no moisture. As the asbestos, which constitutes the binding material for the mica, is an extremely 85 porous material, it will contain air in a very finely divided condition in its pores, so that the new material is built up of mica, air, and asbestos. It is obvious that the manufacture of the new insulating material is not limited 90 to its production in the form of flat plates or sheets, but that it can be molded to any suitable shape.

It will be understood that as this new material is made from incombustible substances 95 which will resist practically any pressure it may therefore be employed very advantageously as a packing material.

In accordance with the process herein described the insulating or packing material, 100 consisting of asbestos and mica, is made up without the employment of an adhesive ma-



terial. In this manner the material is essentially superior to the other materials of asbestos and mica which have always an adhesive in their make-up. The adhesive has the  
5 drawback that it changes, softens, or sweats from influences of heat, as the adhesive consists of an organic substance. Thus when the adhesive materials are absent from the material which consists of asbestos and mica  
10 (which are inorganic) such mutation of the insulating material and injury to the insulating effect are not to be feared. In the process or method under consideration the asbestos is moistened with water, and after  
15 admixing water the mass is compressed. By the adhesion through which the moistened asbestos adheres to the mica a reliable connection is established between the two materials. This connection remains established  
20 even if the moisture between the two materials passes away completely.

We claim—

1. An insulating material consisting of a layer of mica formed of small pieces of mica  
25 arranged scale-like upon each other and a separate layer of asbestos, said layers being

directly connected with each other, substantially as described.

2. An insulating material consisting of independent layers of mica and asbestos attached together, the said mica being in the  
30 form of small flakes or scales, and the asbestos being pressed into contact therewith.

3. The herein-described process of making insulating material consisting in applying  
35 moisture free from adhesive to an asbestos layer and pressing flakes or scales of mica into contact therewith, substantially as described.

4. The process of producing an insulating  
40 packing material composed of asbestos and mica, consisting in moistening the asbestos with water and pressing the mica and asbestos together, substantially as described.

In witness whereof we have hereunto set  
45 our hands in presence of two witnesses.

MAX RAPHAEL.  
LEOPOLD ELIAS.

Witnesses:

RUDOLF FLIESS,  
HERMANN BARTSCH.