INTEGRATED MICA AND METHOD OF MAKING THE SAME

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This invention relates to the forming of mica sheets from either blocks or particles of mica, and has for its primary object the manufacture of sheets of mica of indefinite size without the use of any binder, so that the resultant product is truly a sheet of pure mica.

In this way, the sheet of mica will have substantially all of the desirable properties of original mica, which is only found in its natural state in relatively small crystals.

In order to make larger sheets, mica is usually split into thin layers and put together under heat and pressure, using a binder such as shellac, copal, varnish, etc. However, the presence of these binders deleteriously affects many of the original properties of the mica, such as its resistance to heat and its electrical properties, such as its power factor, etc.

By means of the present process, mica which can be mica scrap, is separated into lamina and then replaced in contiguous relation, without the use of a binder, so that a pure mica sheet is obtained.

Through years of research and experiment the applicant has found that when a piece of mica is split and then is pressed together again quickly, the splittings will recombine with substantially the same force as held them together before they were split apart. This was found particularly true of very thin splittings. When a piece of mica is split, there are presented two virgin surfaces. However, if these surfaces should be touched by a finger or any other substance, such as a knife, or if they should be exposed to the open air for any length of time, they can no longer be made to recombine. No amount of cleansing the surfaces will reestablish the cohering force. It follows then that if mica can be split apart without marring or contaminating the surfaces in any shape or form, the thin layers can once more be put together and will form a perfect mica sheet.

The following sets forth the prime requisites for making integrated micas:

First: The surfaces of the mica splittings must be virgin.

Second: The splittings must not be permitted to be contaminated.

Third: The mica when split must be very thin, preferably to a thickness of 1/10000 of an inch or less.

As a result of the research on the primary facts as herein stated, the applicant has conceived a method of fabricating mica as further described and as shown in a semi-diagrammatic manner in the accompanying drawing.

In the drawing:

Fig. 1 is a flow diagram showing the means for fabricating mica sheets in accordance with the invention.

Fig. 2 is a plan view of such a sheet.

Fig. 3 is an enlarged cross-sectional view as taken on the line 5--5 of Fig. 2.

Describing the invention in greater detail, a quantity of mica blocks of varying size and thickness, or even mica scrap, is subjected to the cleansing action of water or other fluids. The cleansing may be accomplished in more than one stage, if desired, to rid the mica of dirt, stones or any other impurities. The cleansed mica may then be dried in drying ovens to rid the pieces of all moisture. Having been thus cleansed, the mica is preferably fed to a splitting device 10, which is shown in its present preferred form. This splitter preferably comprises a casing 11, having a hollowed-out portion which is shaped like a figure eight. Thus the casing 11 may be provided respectively with lower and upper chambers 12 and 13 and a communicating restricted opening 14, formed by at least one in-reaching wall 15 of the casing. This wall should preferably come to a substantially sharp edge so that when a stream of liquid under high pressure strikes the edge it will be divided, the parts of the stream moving in the direction of the arrows. In this manner, the stream of liquid will more or less follow the contour of the figure eight. There will then be a crossing of currents at the restricted opening 14 when the liquid from the right hand wall of the upper chamber cuts across the stream from the lower chamber. The high pressure liquid from the stream leaving the high pressure nozzle 16 will further cause a continuous turbulence at this point.

The liquid preferred to be used as the liquid medium in the splitter is methyl alcohol, although it has been found that distilled water which has had the air driven therefrom is also quite effective.

In actual operation, mica will be dropped into the liquid and will rest at the bottom of chamber 12. The action of jet 16 will be such as to divide the stream at the edge 15 and this action will carry the mica around in a counter-clockwise manner. The natural path of the mica will be from the bottom of chamber 12 around the right hand side of said chamber. The mica will then have a tendency to follow the left hand side of the upper chamber 14. However, when a piece of mica approaches the restricted opening, it will strike the turmoil of cross currents which will...
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3. The method of forming a sheet of mica which consists in cleansing pieces of mica to rid the same of impurities and foreign particles, freeing the mica pieces of moisture, splitting said pieces while they are immersed in a medium which obviates contamination of the surfaces of the mica splittings, and forming a stratified sheet of said splittings while they remain immersed in said medium.

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9. A fabricated laminated mica sheet comprising extremely thin laminae having virgin surfaces, said laminae being arranged in random fashion whereby their surfaces are in continuous relation and enabling the natural cohesive forces resident in the laminae to become effective, and whereby the laminated sheet differs from a natural mica sheet in that the laminae are relatively smaller and frequently lie in more than one plane.

10. The method of preparing mica sheets which consists in separating the laminae of a natural mica sheet into fine splittings in a liquid medium whereby the virginity of the surfaces of said splittings is retained to retain the natural cohesive forces of the mica splittings, and depositing said splittings upon a pervious surface while immersed in said liquid medium.

11. The method of fabricating mica sheets which consists in subjecting pieces of mica to a splitting force while said mica pieces are immersed in a liquid medium whereby the virginity of the surfaces of the resulting mica splittings is retained to retain the natural cohesive forces of the mica pieces, and depositing said mica splittings upon a pervious surface while said splittings remain immersed in said liquid medium.

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