

No. 764,810.

PATENTED JULY 12, 1904.

C. W. JEFFERSON.

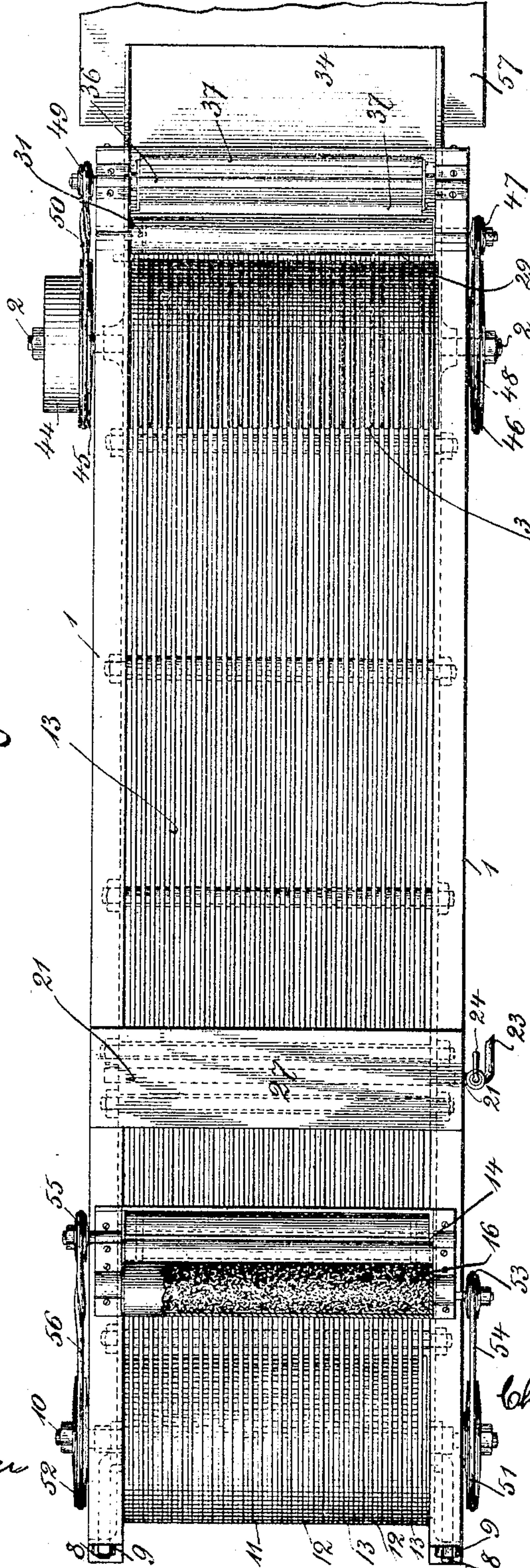
METHOD OF TREATING PIECES OF MICA OR OTHER MATERIAL TO PREPARE THEM FOR ADHESIVE UNION WITH EACH OTHER OR WITH OTHER ARTICLES.

APPLICATION FILED AUG. 8, 1902. RENEWED JAN. 19, 1904.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



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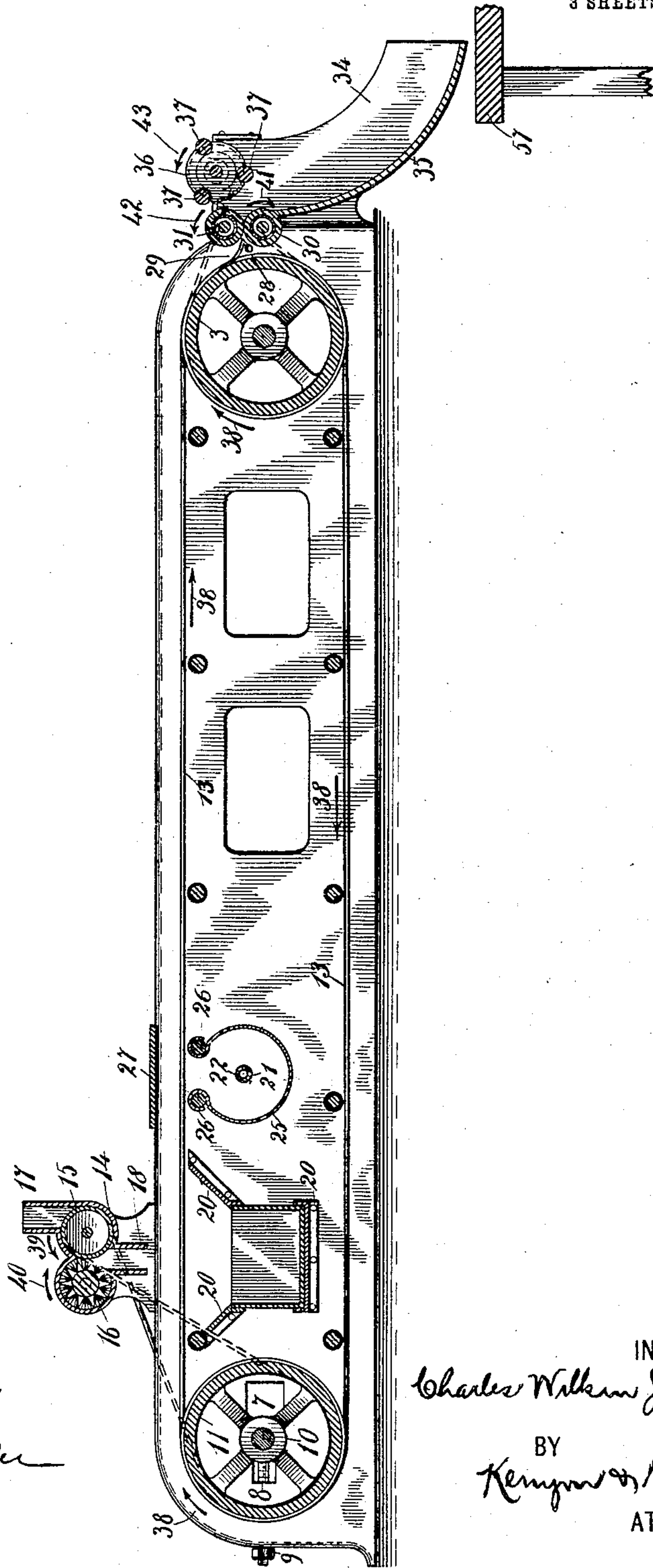
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3 SHEETS—SHEET 2.

Fig. 2.



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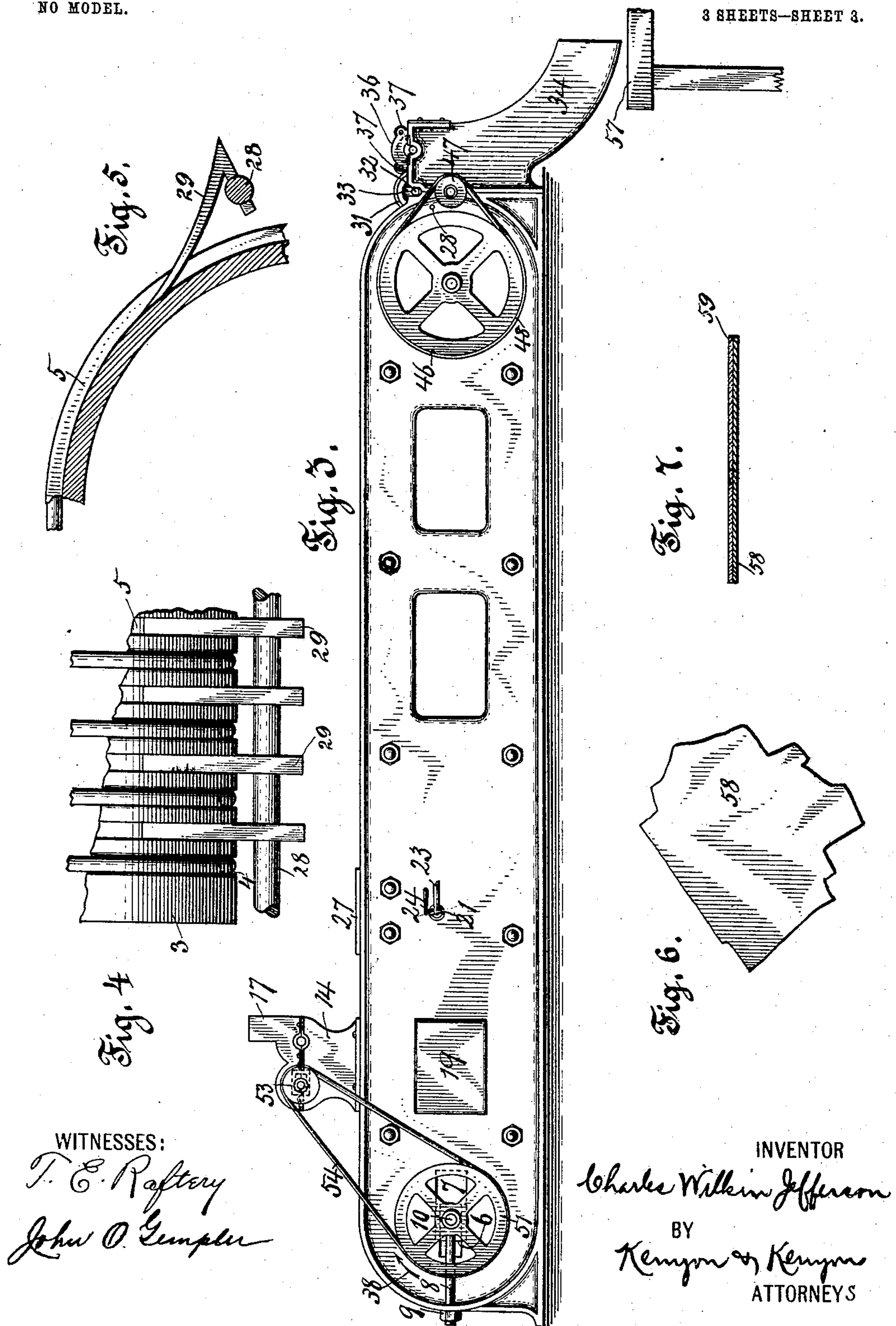
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NO MODEL.

3 SHEETS—SHEET 3.



WITNESSES:
T. E. Raftery
John O. Gumpel

INVENTOR
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UNITED STATES PATENT OFFICE.

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OF NEW JERSEY.

METHOD OF TREATING PIECES OF MICA OR OTHER MATERIAL TO PREPARE THEM FOR ADHESIVE UNION
WITH EACH OTHER OR WITH OTHER ARTICLES.

SPECIFICATION forming part of Letters Patent No. 764,810, dated July 12, 1904.

Application filed August 8, 1902. Renewed January 19, 1904. Serial No. 189,758. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WILKIN JEFFERSON, a subject of the King of Great Britain, and a resident of Schenectady, county of Schenectady, and State of New York, have invented new and useful Methods of Treating Pieces of Mica or other Material to Prepare Them for Adhesive Union with each other or with other Articles, of which the following is a specification.

My invention relates to methods of treating pieces of mica or other material to render them stronger and more durable or to prepare them for adhesive union with each other or with other articles.

My invention is particularly adapted for preparing pieces or scales of mica or other insulating material, so that each piece or scale may be separately strengthened and also be in condition for uniting it to another piece or scale without the addition of any other material or substance.

Electrical insulators have been made from comminuted or pulverized mica or from mica scales and a cement of insulating material. Insulators have also been made by building up layers of mica scales or pieces with interposed layers of cement. In both of said methods, however, and in all methods of making electrical insulators from two or more substances one of which is an adhesive or cement the adhesive, so far as I am aware, has been applied to a number of pieces of said substance or substances during the process of uniting them into an integral whole.

By my invention each separate piece or scale of mica or other insulating material may be so treated that it can be used not only as a separate insulator of a tough and durable quality and be transported without danger of breaking or other injury or of becoming united together by adhesion, but that will also be in condition for adhesively uniting it to other pieces or scales without the addition of any other material.

My invention consists of the method herein described, and the accompanying drawings

illustrate an embodiment of my method, in which—

Figure 1 is a plan view of a machine for carrying out my improved method. Fig. 2 is a longitudinal section of the same. Fig. 3 is a side elevation of the same. Figs. 4 and 5 are enlarged details showing a small section of the drum at the rear of the machine and the endless bands and pickers. Fig. 6 is a plan view on a much larger scale than that of the preceding figures of a scale of mica or similar substance to be coated by adhesive material, and Fig. 7 is an edge view of such a scale and its coating.

Similar numbers represent like parts in all the figures.

The following is a description of a machine for carrying out my improved method:

1 1 are two parallel vertical side plates or supports.

2 is a shaft extending across the side plates 1 and journaled near the rear ends of the same. Secured to said shaft 2 between the side plates 1 is a drum 3, provided with two sets of peripheral grooves 4 and 5, one set of grooves alternating with those of the other set and being between them.

6 6 are two blocks supported in oblong slots or openings 7 in the side plates 1, said slots being parallel longitudinally with said plates and conforming with each other.

8 8 are rods secured to the front ends of the blocks 6 and extending loosely through openings or holes in the front of the machine, where they are screw-threaded and provided with nuts 9 for engaging with said threaded ends. Said nuts and screw-threaded rods provide means for longitudinal adjustment of the blocks 6 in the slots 7.

10 is a shaft journaled near each end in the two blocks 6 and extending across the machine.

11 is a drum similar to the drum 3, except that it has only one set of peripheral grooves 12, which register or are about the same distance apart as the grooves 4 in the drum 3.

13 represents a set of endless bands sur-

rounding the two drums 3 and 11 and held in place on said drums by the grooves 4 and 12, in which said bands rest. These bands 13 are preferably made of wire.

5 14 is a casing supported upon the upper sides or edges of the two side plates 1 and extending across the same and over the bands 13, near the front of the machine. In this casing 14 is a small roller 15 and a rotary
10 brush 16, said roller and brush being adapted to rotate in peripheral contact with each other. This roller 15 and brush 16 also extend over and across the bands 13. The upper portion of the casing 14 is provided with a hopper 17,
15 and the lower portion of the casing 14, below the roller 15 and brush 16, is provided with a chute 18. Below the chute 18 and between the upper and lower course of the bands 13 is a removable box 19 and its supports 20.
20 This box 19 extends under the upper course of the bands 13 and directly under the chute 18 for the purpose of collecting anything that may fall from said bands under said chute. Back of the box 19 and between the drums 3
25 and 11 is a gas-pipe 21, extending transversely across the machine and in a direction across the bands 13 and between the upper and lower courses of said bands. This pipe 21 is provided with perforations or burners
30 22 in the upper portion of its periphery, and the pipe 21 is connected with a gas-supply pipe 23 outside of one of the side plates 1 and also with a regulating-cock 24.

25 is a screen, preferably of sheet metal,
35 surrounding pipe 21 except at its upper periphery. This screen may be supported in any appropriate manner; but, as shown, is supported by two cross-bars 26, extending between the two plates 1 and to which the two
40 ends of the screen 25 are secured.

27 is a plate, preferably of fire-clay or metal, secured to the upper edges of the two side plates 1 and extending over and across the bands 13 and over the pipe 21. The screen 25 and
45 the plate 27 are deflectors of the heat that is generated by the consumption of gas at the perforations 22, the heat being deflected to the space between the upper portion of the screen 25 and the plate 27, and therefore upon the
50 portion of the bands 13 that passes through this space and upon anything that is resting upon said bands at such place.

28 is a rod extending across the machine and in the rear of the drum 3.

55 29 represents a series of elbow-arms, the shorter portions of which pass through and are held by the rod 28, the longer portions of said arms 29 being beveled at their free ends on the under side and resting in the grooves 5.
60 (See Fig. 5.)

30 and 31 are feed-rollers situated back of the drum 3 and with their axes parallel with that of said drum. These feed-rollers 30 and 31 are in peripheral contact with each other
65 below the plane of the upper surface of the

drum 3 and with the roller 31 resting upon the roller 30. The roller 30 is journaled in bearings in the two side plates 1, and the roller 31 has its journals 32 resting in a U-shaped socket 33 in the support of the ma-
70 chine above the roller 30. The plane or line of contact of the two rollers 30 and 31 is substantially on a plane with the elbows of the arms 29, or said elbows should extend some-
75 what between the peripheral surfaces of the two rollers 30 and 31. Back of the rollers 30 and 31 is a rearwardly-extending chute 34, the front wall 35 of said chute being some-
80 what in front of the rear portion of the peripheries of the rollers 30 and 31.

36 is a cylinder journaled at the upper portion of the chute 34 and back of the rollers 30 and 31. This cylinder 36 is provided with longitudinal projections 37, which are shown
85 cylindrical in cross-section, although this is immaterial. The cylinder 36 should be so journaled that the projections 37 during the rotation of the cylinder would come about opposite or below the plane of contact of the two roll-
90 ers 30 and 31. The two rollers 30 and 31 are feed-rollers for guiding any material which might be passing along the endless bands 13 into the chute 34, and the projections 37 on the cylinder 36 act as paddles or strikers to
95 force the material passing between the rollers 30 and 31 and into the chute 34 down said chute. The arms 29 act as guides to the feed-rollers 30 and 31 for any material which may
100 be fed back on the bands 13 if said material extends over the edges of said bands, the longer portion of said arms 29 serving as inclined ways for the bands 13 to the contact of the two rollers 30 and 31.

In the practical operation of the machine the bands 13 and the drums 3 and 11 revolve in
105 the direction of the arrows 38. The roller 15 and the brush 16 revolve in the direction of the arrows 39 and 40, respectively, brush 16 preferably somewhat faster than roller 15. The feed-rollers 30 and 31 revolve in opposite
110 directions, as shown by the arrows 41 and 42, respectively, and the cylinder 36 revolves in the direction of the arrow 43. Any means for giving the above movements to the different mechanisms may be used; but I have shown
115 the following as being a simple and efficient means for the purpose stated.

44 is a driving-pulley secured to the shaft 2 of the drum 3, (see Fig. 1,) which pulley may receive rotary motion in the direction of the
120 arrows 38, Fig. 2, from a belt. (Not shown.)

45 and 46 are pulleys secured to the shaft 2 and situated, respectively, adjacent to the pulley 44 and on the opposite side of the machine and outside of the plate 1. A pulley 47,
125 secured to the shaft of roller 30, is connected by a belt 48 with the pulley 46. A pulley 49, secured to the shaft of the cylinder 36, is connected by a cross-belt 50 with the pulley 45. The shaft 10 of the drum 11 is provided with
130

two pulleys 51 and 52, secured, respectively, to said shaft at the right and left end of the same. A pulley 53 is secured to the shaft of the brush 16, and this pulley is connected
 5 with pulley 51 by a belt 54. Pulley 55 on the roller 15 is connected by cross-belt 56 with pulley 52. If the pulley 44 be rotated in the direction of the arrows 38, the two drums 3 and 11 will be rotated in the same direction.
 10 Through the shaft 2, the pulleys 45 and 46, belts 48 and 50, and pulleys 47 and 49 the rollers 30 and 31 will be made to revolve in the direction of the arrows 41 and 42 and the cylinder 36, with its projections 37, will be
 15 made to revolve in the direction of the arrow 43. The rotation of the drum 11 in the direction of the arrow 38 will through the pulleys 51 and 52, belts 54 and 56, and pulleys 53 and 55 cause the brush 16 and roller 15 to
 20 revolve in the direction of the arrows 40 and 39, respectively.

Suppose it be desired to coat or cover the surface of a scale or piece of mica with shellac or similar adhesive material. The gas is
 25 turned into the pipe 21 by means of cock 24, and the burners or perforations 22 are then lighted. The heat from the jets will then be deflected, as above stated, by means of the screen 25 and plate 27 to and upon the bands 13
 30 as they pass between said screen and plate. If the shellac or other adhesive material is to be applied in a powdered state to the scales or pieces of mica or other material, this shellac or other adhesive material is dropped in a
 35 powdered state into the hopper 17. The machine is made to operate by the turning of the drums and pulleys, as above set forth, and a person standing at the front of the machine or beyond the drum 11 deposits the scales or
 40 pieces of mica or other material separately upon the bands 13, and preferably so as not to overlap each other. These scales or pieces of mica will rest upon and overlap the bands 13 and will be carried by them under the chute
 45 18. The powdered adhesive material will be guided and directed by the feed-roller 15 and brush 16 down the chute 18, (which brush will have the effect of spraying the powdered adhesive down such chute.) This powdered ad-
 50 hesive will fall upon the scales or pieces of mica or other material as they pass under the chute 18, and what does not alight upon said scales or pieces will pass between the bands 13 and drop into the box 19. The scales or pieces,
 55 with the powdered adhesive upon them, will be carried by the bands 13 over the lighted burners 22 and between the screen 25 and deflector-plate 27. The shellac or other adhesive upon the scales will be heated and melted, and thus
 60 give an adhesive coating to the top surface of said scales. They will then be carried by the bands 13 to the drum 3 and be cooled during such passage, so that the adhesive will dry on the scales. In passing over said drum
 65 the portion of the scales that projects over the

bands 13 will be picked off or lifted by the inner ends of the arms 29, so as to slide down said arms to their elbows with the dried adhesive side of the scales uppermost, and the
 coated scales will be guided by said arms and
 70 elbows between the rollers 30 and 31 to the chute 34. The coated scales as they emerge from between the rollers 30 and 31 are forced down the chute 34 by means of the projec-
 75 tions 37 on the cylinder 36, which strike said coated scales from above. These scales will then drop from the lower end of the chute 34 upon a table or any other support 57,
 80 said scales falling upon said table or support with their coated side uppermost and where they can then be picked up and handled separately. The scale 58 is shown in Fig. 6
 85 before it is coated, and in Fig. 7 such scale is shown after having one of its surfaces coated with the adhesive 59.

The bands 13, having considerable space between them, serve as an open or skeleton carrier for the scales or pieces of mica or other material, so that said scales or pieces may have the least possible supporting-surface.
 90 This construction will permit not only every opportunity for the heat caused by the burners 22 and deflectors 25 and 27 to reach the scales or pieces on which the adhesive has
 95 fallen, but also permit the free circulation of air to the coated scales or pieces during their journey to the chute 34, whereby the adhesive on every independent scale or piece will be fully melted and afterward dried. The
 100 bands 13 being very narrow, there will be very little space upon their upper surfaces for holding the adhesive material as it falls from the chute 18, and if these bands are round in
 105 cross-section, like a wire, there will be no surface whatever upon them on which to hold the adhesive. Whatever adhesive, therefore, that does not fall upon the scales or pieces
 110 resting upon the bands 13 will drop through between said bands either upon the floor or upon any receiving device which may be situated under said bands. The endless carrier
 115 made of the endless bands 13 will receive and hold very little of the adhesive. If any of the coated scales or pieces should happen to pass around the drum 3 without being carried
 120 between the rollers 30 and 31 into the chute 34, said scales or pieces would continue along on the bands 13, on the under side of the same, and the adhesive would be given an opportunity for a more thorough drying in passing
 125 to and over the drum 11, where they could be removed by the operator standing in front of said drum if they had not dropped off of the lower course of the bands 13 between the drums 3 and 11.

If it be desired to apply the adhesive in a liquid form to the pieces or scales of mica or other material, such liquid adhesive when put
 into the hopper 17 will be caused by the re-
 130 volving roller 15 and brush 16 to fall in a

spray or shower through the chute 18 on the bands 13 and the scales or pieces resting on said bands. If the adhesive is of such a nature as to have its solvent evaporated by heat, such adhesive will become partially or wholly dried in passing between the deflectors 26 and 27, and if not entirely dried they will become so by the time the scales or pieces reach the drum 3, when said scales or pieces will have a coating similar to that which was obtained by the use of the dried powdered adhesive.

From the above it will be seen that by my invention scales or pieces of mica or other material may be readily and very simply coated with a substance that will render said scales or pieces stronger and more durable and also that will prepare them for adhesive union with each other or other articles without the addition of any other material.

My invention in its broader aspects is not limited to the precise method herein described, as many changes in the same other than those suggested may be made without departing from the main principles of my invention or sacrificing its chief advantages.

What I claim as new, and desire to secure by Letters Patent, is—

1. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in applying to said pieces an adhesive substance, and subjecting said pieces individually with the applied adhesive substance to the action of heat, whereby the surface of each of said pieces will be independently covered with adhesive material.

2. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in subjecting the pieces to a falling adhesive substance, and subjecting the said pieces individually with the applied adhesive substance to the action of heat, whereby the surface of each of said pieces will be independently covered with adhesive material.

3. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in applying to said pieces an adhesive substance in a finely-divided state and subjecting said pieces individually with the applied adhesive substance to the action of heat, whereby the surface of each of said pieces may be independently covered with adhesive material.

4. The improved method of treating scales or pieces of mica or similar material, to prepare them for adhesive union with each other or with other articles, consisting in applying to said pieces an adhesive substance, and subjecting said pieces individually with the applied adhesive substance to the action of heat, but without coming in contact with the heat-

ing device, whereby the surface of each of said pieces will be independently covered with adhesive material.

5. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in applying to said pieces an adhesive substance, and subjecting said pieces individually with the applied adhesive substance to the action of heat, whereby the surface of each of said pieces will be covered with adhesive material, and then drying said adhesive.

6. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in applying to said pieces an adhesive substance, and subjecting the said pieces individually with the applied adhesive substance to the action of heat, whereby the surface of each of said pieces will be covered with adhesive material, and then drying said adhesive by cooling.

7. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in subjecting the pieces to a falling adhesive substance in a finely-divided state, and subjecting the said separated pieces individually with the applied adhesive substance to the action of heat, whereby the surface of each piece may be independently covered with adhesive material, and said material melted, and thus caused to adhere to said surface, and then drying said adhesive.

8. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in applying to said pieces an adhesive substance, and subjecting said pieces individually with the applied adhesive substance to the action of heat, whereby the surface of each of said pieces will be covered with adhesive material, and positively removing the coated pieces.

9. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in subjecting the said pieces to a falling adhesive substance in a finely-divided state, and subjecting said pieces individually with the applied adhesive substance to the action of heat, whereby the surface of each piece may be independently covered with adhesive material, and said material melted, and thus caused to adhere to said surface and then drying said adhesive by cooling.

10. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in applying to said pieces an adhesive substance, and subjecting the said pieces individually with the applied adhesive substance to the action of

heat, whereby the surface of said pieces will be covered with adhesive material, and picking off the coated pieces.

11. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in applying to said pieces an adhesive substance, and subjecting said pieces individually with the applied adhesive substance to the action of heat, whereby the surface of each of said pieces will be covered with adhesive material, and then drying said adhesive and removing the coated pieces.

12. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in applying to said pieces an adhesive substance, and subjecting said pieces individually with the applied adhesive substance to the action of heat, whereby the surface of said pieces will be covered with adhesive material, and positively removing the coated pieces, and finally depositing them with their coated surfaces uppermost.

13. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in applying to said pieces an adhesive substance, and subjecting said pieces individually with the applied adhesive substance to the action of heat, whereby the surface of each of said pieces will be covered with adhesive material, and then drying said adhesive and removing the coated pieces, and finally depositing the coated pieces with their coated surfaces uppermost.

14. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in laying said pieces on a moving support, passing the support bearing the pieces where the surfaces of the latter will be subjected to the application of an adhesive substance, and passing the moving support and the pieces individually with the applied adhesive substance through a heated area, whereby the surface of each

piece may be independently covered with adhesive material, and said material melted and thus caused to adhere to said surface.

15. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in laying said pieces on an open-work support, applying to said pieces while on said support an adhesive substance, and subjecting said pieces individually with the applied adhesive substance to the action of heat, whereby the surface of each of said pieces will be covered with adhesive material.

16. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in laying said pieces on an open-work support, passing the support bearing the separated pieces under a falling adhesive substance, and passing said support bearing the pieces individually with the applied adhesive substance through a heated area, whereby the surface of each piece may be independently covered with adhesive material, and said material melted and thus caused to adhere to said surface.

17. The improved method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in subjecting the pieces to a falling adhesive substance in a finely-divided state, and subjecting said pieces and adhesive substance to the action of heat, whereby the surface of each piece may be independently covered with adhesive material and said material melted, and thus caused to adhere to said surface, and then drying said adhesive, and finally depositing the coated pieces separately and with their coated surfaces uppermost, whereby they may be independently handled in further operations.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES WILKIN JEFFERSON.

Witnesses:

ALLAN H. JACKSEN,
EDWARD C. WHITMYER.