E. COOPER.

MICA SPLITTING MACHINE.

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1,155,298.

Patented Sept. 28, 1915.

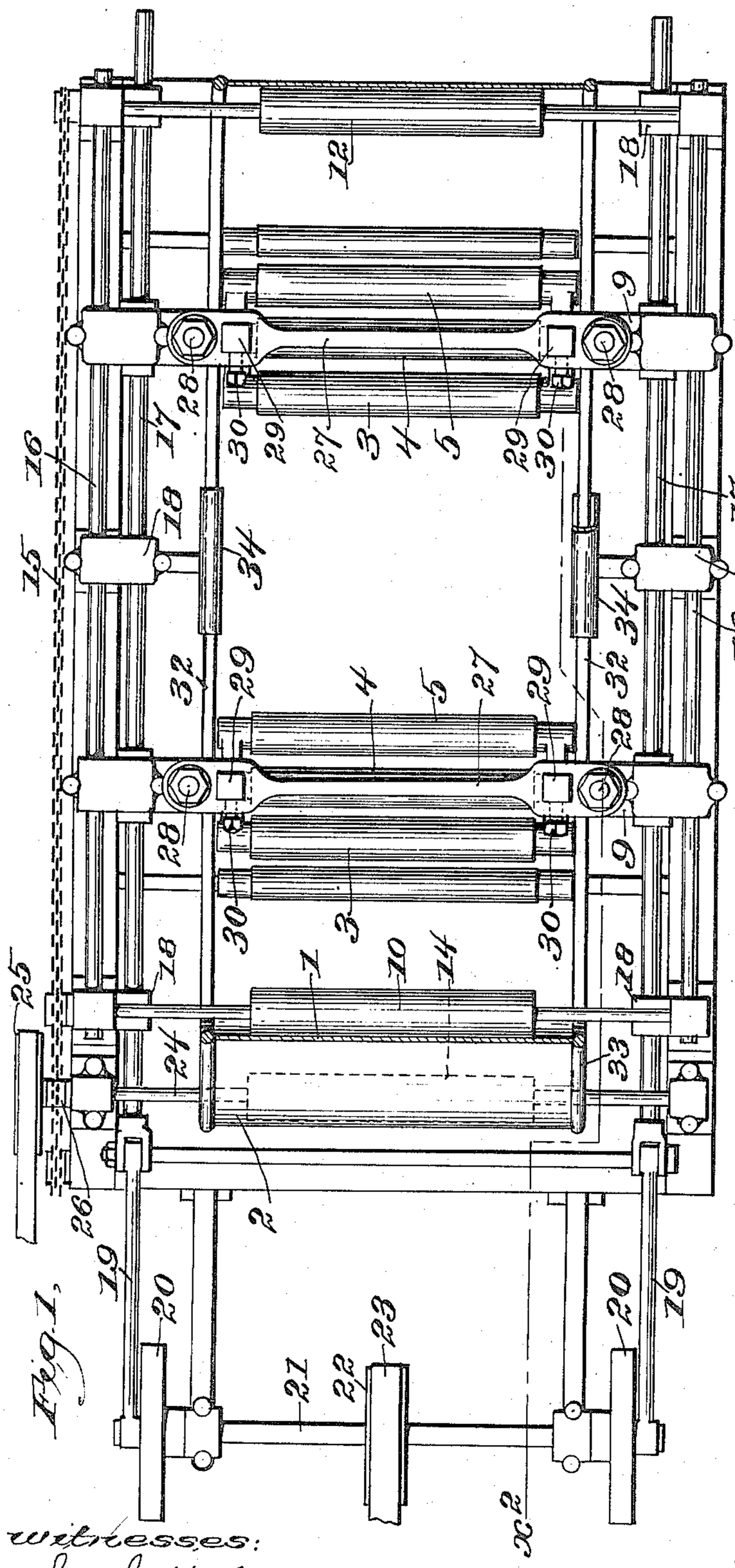

Fig. 1.

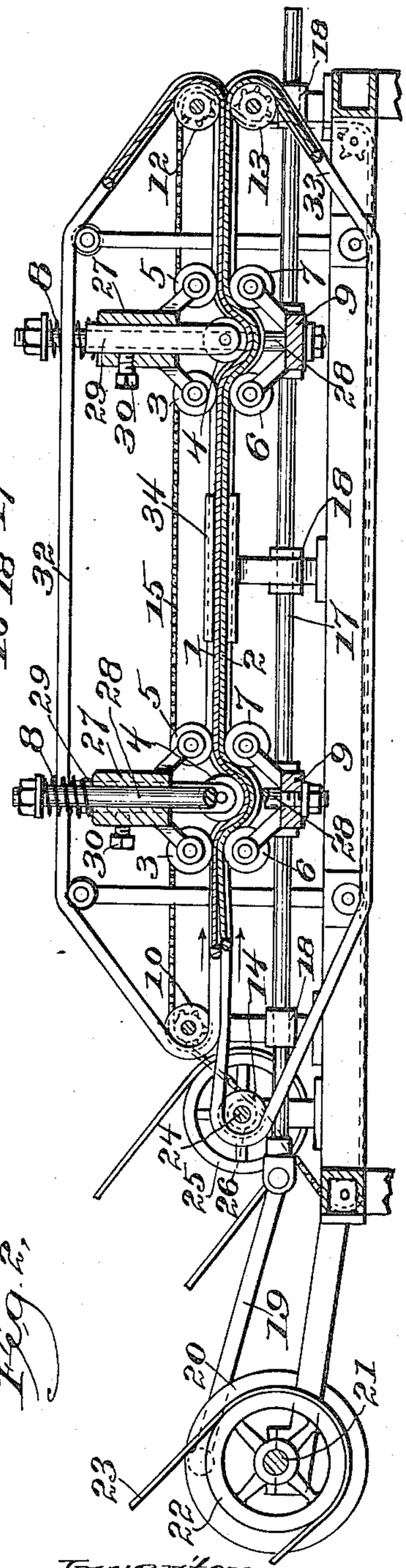

Fig. 2.

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UNITED STATES PATENT OFFICE.

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MICA-SPLITTING MACHINE.

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To all whom it may concern:

Be it known that I, EDWARD COOPER, residing in Newton, county of Middlesex, and State of Massachusetts, (whose post-office address is care of American Mica Company, Newton, Massachusetts,) have invented an Improvement in Mica-Splitting Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to an apparatus for splitting mica, and is embodied in a machine having bending devices adapted to act simultaneously on the material at opposite sides thereof, the machine having a flexible holder composed of two adjacent parts or layers to hold the material in place during the operation. The bending devices also have a rubbing action so that in the operation the material is rubbed as well as bent. To bring about the bending and rubbing action, the machine is provided with means whereby the flexible holder for the material, and the bending means, respectively, are arranged to be moved one with relation to the other in the direction of the plane of the holder. In the construction shown, the bending devices are provided with means whereby they are reciprocated with relation to the holder so that they move back and forth along the opposite surfaces of the holder throughout the operation. The flexible holder may also be utilized as a conveyer for the material by providing the apparatus with means whereby said holder is caused to travel continuously in one direction while the splitting process is being carried on. It is obvious that such an arrangement of the holder will in itself produce the necessary relative movement of the material and the bending devices; but it adds to the efficiency of the machine if the reciprocating movement of the bending devices is employed in addition to the movement of the holder.

The bending devices are shown as consisting of rubbers or rolls yieldingly pressed toward each other so as to engage simultaneously the opposite sides of the holder between them; and to insure the positive bending of the material one of the rolls at one side extends into the space between the two rolls at the opposite side, so that the material is bent by the action of the rolls in passing through the sinuous space between them.

The invention is further embodied in certain novel details of construction and arrangement, which will be hereinafter more fully described.

Figure 1 is a top plan view partly in section, of a machine embodying the invention; and Fig. 2 is a longitudinal vertical section of the machine, the section being taken about on the line X^2 of Fig. 1.

In the construction shown, the flexible holder consists of two adjacent layers of material, 1 and 2, the material used preferably being a fabric, such as canvas; and the layers lie practically in contact with each other or with the mica which is to be operated upon when it is interposed between them. The bending devices act upon the opposite sides or faces of the flexible holder and are herein shown as consisting of rolls 3, 4, 5, 6, and 7; the rolls 3, and 5, being shown as yieldingly pressed by means of springs 8, toward the rolls 6 and 7 respectively, which are mounted on a frame 9. One of the rolls, herein shown as the roll 4, projects beyond the companion rolls 3 and 5, at the same side of the holder, and thereby extends beyond the normal plane of the holder into the space between the rolls 3 and 5; so that by setting up a relative movement of the bending devices and the holder substantially in the direction of the plane of the holder, the mica which is contained in the holder is flexed and at the same time rubbed at opposite sides.

It is practicable in order to bring about a continuous operation, to utilize the flexible holder as a conveyer; and for this purpose the parts 1 and 2 of the holder are made in the form of endless belts which travel over rollers 10, 12, 13, and 14, which are adapted to be rotated by means of sprocket wheels and a sprocket chain 15. This travel of the holder constitutes a relative movement of the holder and bending devices which is sufficient to split the mica; but in order to make the operation more thorough, the bending devices themselves are adapted to have a reciprocating movement which takes place during the travel of the holder. In the construction shown, the frame 9 which supports the bending devices is mov-

ably mounted on rods 16, at opposite sides of the machine, said frame being connected to rods 17 which are capable of sliding endwise in bearings 18, and connected through connecting rods 19, with wheels or cranks 20; the said crank wheels 20, are herein shown as mounted at opposite ends of a shaft 21, provided with a pulley 22, capable of being driven by a belt 23. The shaft 24, which carries the roll 14 for the lower member of the holder, is shown as having a driving pulley 25, and also as being provided with a sprocket wheel 26, which engages the sprocket chain 15. For convenience in supplying the machine with the mica which is to be split, the roller 14, is so situated that the lower member 2 of the holder extends beyond the roller 10 and the upper member 1, of the holder so that a portion of the surface of part 2 of the holder is adapted to receive the mica before the parts of the holder come together.

In the operation of the machine as thus far described the holder containing the mica travels continuously in the direction indicated by the arrows, while the bending devices move back and forth, thus acting repeatedly on each piece of mica that comes between them.

In practice it is found that the size of the rolls and the equivalent parts of the bending devices may be varied to advantage in accordance with the quality of the mica which is acted upon and the extent to which the splitting is to be carried. As herein shown the offset of the roll 4, is somewhat exaggerated as well as the size of the rolls; it being understood that the proportions used depends upon the extent to which the mica is to be split. When the mica is to be split to the thinnest practicable extent, much smaller rolls or rubbers are used, and the amount of offset is diminished.

In practice several machines may be used, or the dimensions of the flexing devices may be varied throughout a single machine where a number of such devices are used; a sharper bend and a larger roll or rubber being used to split the thicker pieces. As herein shown the rolls 3, 4, and 5, are mounted on a sliding frame 27, which is capable of vertical movement against the stress of the springs 8, on guide rods 28, which extend upward from the frame 9. The roll 4, is adjustable with relation to the rolls 3 and 5, being shown as supported on rods 29, contained in sockets in the frame piece 27, which supports the rolls 3 and 5, in which sockets they are adapted to be held in their adjusted position by means of set screws 30.

While it is not essential to the operation of the machine, it is desirable that the parts 1 and 2 of the flexible holder should be held under some tension both laterally and longitudinally. The longitudinal tension can be provided for by regulating the relative speed of the rolls over which the parts of the holder are caused to travel. For the purpose of holding the parts of the holder under slight lateral tension, I have shown the said holder as provided along the edges of the two parts with somewhat enlarged portions 32 and 33, which are adapted to travel in guides 34, said guides having edges extended toward each other so as to allow the bodv of the holder to travel between them.

From the foregoing description it will be seen that the opposite surfaces of the mica sheet are positively acted on at the same place in the bending as well as the rubbing operation, the flexible holder lying between and in contact with the opposed bending devices throughout the entire operation. Moreover, while the holder may conveniently be used as a conveyer, it is not essential to the operation that it be so used, since the bending is accomplished by independent devices.

What I claim is:

1. An apparatus for splitting mica which consists of a holder composed of layers of flexible material adapted to receive the mica to be acted upon between them, combined with bending devices having coöperating members which engage said holder at the opposite faces thereof, and means for producing a relative movement of the bending devices and the holder in the direction of the plane of the holder whereby the mica plates are flexed by the bending devices while confined between the layers of the holder.

2. In a machine for splitting mica, the combination with a flexible holder having two adjacent layers adapted to receive the unsplit mica between them; of bending devices at opposite sides of said holder, embracing said holder between them; and means for producing a relative movement of said bending devices and holder.

3. An apparatus for splitting mica which consists of a holder comprising adjacent layers of flexible material, combined with reciprocating bending devices acting on opposite sides of said holder; and means for actuating said bending devices in the reciprocating movement thereof.

4. An apparatus for splitting mica which consists of a holder comprising adjacent layers of flexible material, combined with bending devices acting on opposite sides of said holder; means for reciprocating said bending devices and means for causing said holder to travel with relation to said reciprocating devices.

5. An apparatus for splitting mica comprising a holder of flexible material having adjacent layers, means for holding the opposite edges of said holder parallel to each

other and equidistant from each other, bending devices operating simultaneously on opposite surfaces of said holder where it lies between them; and means for producing a relative movement of said flexing devices and holder.

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

EDWARD COOPER.

Witnesses:
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