

Dec. 24, 1929.

L. McCARTHY

1,740,662

MACHINE FOR MAKING COMPOSITE SHEETS

Filed Nov. 4, 1926

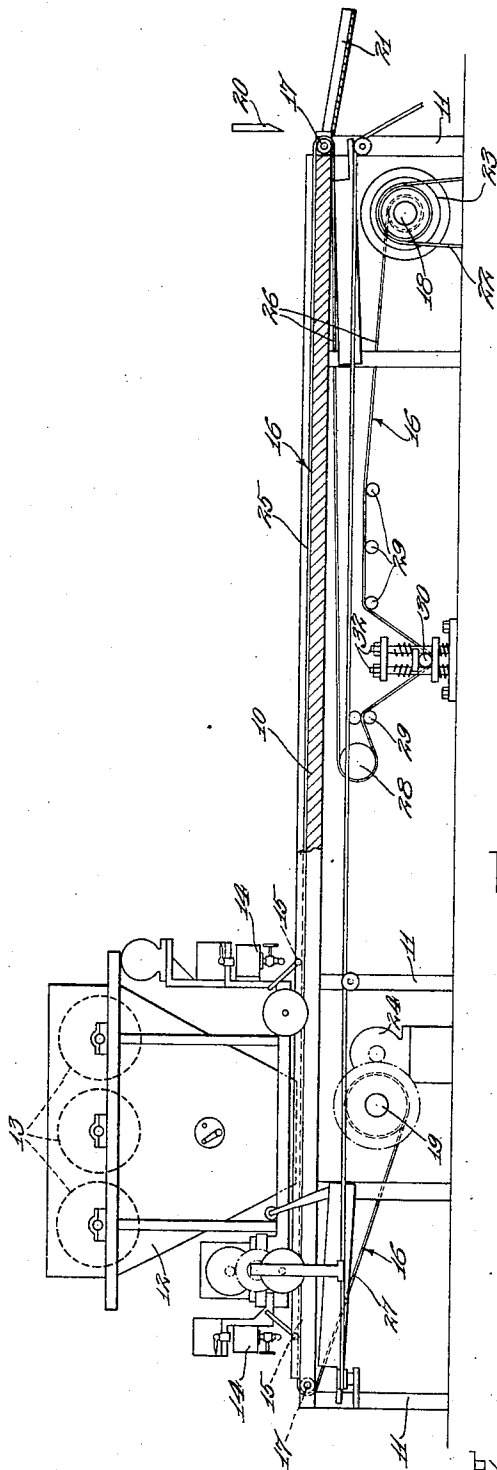


Fig. 1--

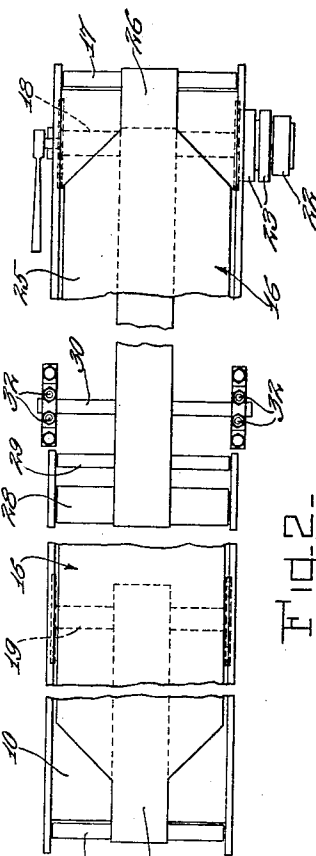


Fig. 2--

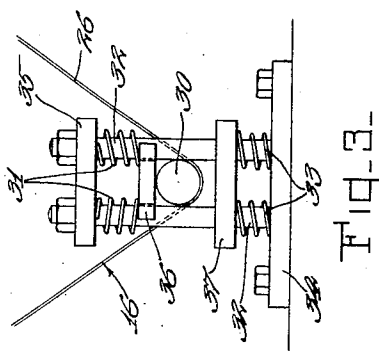


Fig. 3--

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UNITED STATES PATENT OFFICE

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MACHINE FOR MAKING COMPOSITE SHEETS

Application filed November 4, 1926. Serial No. 146,176.

This invention relates to machines for forming composite sheets by the use of an adhesive binder, and especially, although not exclusively, to machines, of the type shown
5 in a prior application filed November 6, 1922, Serial No. 599,248, patented March 29, 1927, No. 1,622,795, for forming composite mica sheets. A machine of this type comprises a suitable elongated bed on which is disposed
10 a flexible belt and over which is arranged to travel a carriage having means for showering the mica flakes on the belt, means for applying a liquid adhesive binder to the flakes so deposited, and means for rolling the flakes
15 and binder on the belt to unite them into a composite sheet. Such a machine also includes a winding drum or reel upon which the ends of the belt may be wound after the completion of the sheet to draw the belt
20 over the bed and about the end thereof and thereby discharge the finished sheets, a second and similar drum or reel being provided to return the belt to its normal position on the bed after the sheets have been discharged.

25 In the operation of a machine of this type, more or less of the adhesive binder accumulates upon the operative upper surface of the belt, or that portion thereof upon which the composite sheets are formed, and when the
30 belt is wound upon the reel or drum in inter-engaging convolutions, more or less of this adhesive material is transferred to the opposite or under surface of the belt, that is to say, the surface which engages the bed. This
35 causes adhesion between the belt and the bed, making it difficult to draw the former over the latter in the normal operation of the machine, and also causes quantities of adhesive to accumulate on the bed itself, making
40 it necessary to clean the latter at frequent intervals with consequent interruption to the operation of the machine.

The present invention has for its object to overcome the difficulties last referred to,
45 and to this end contemplates a construction, including a belt and a winding drum or reel therefor, in which, however, the operative portion of the belt, or that portion upon which the sheets are formed and upon which
50 the adhesive binder tends to accumulate, is

not wound upon the drum or reel, so that no transfer of the adhesive material from the upper to the lower face of the belt occurs.

The foregoing and other objects of the invention, together with means whereby the latter may be carried into effect, will best be understood from the following description of a preferred form thereof illustrated in the accompanying drawings. It will be understood, however, that the particular construction described and shown has been chosen for purposes of exemplification merely, and that the invention, as defined by the claims hereunto appended, may be otherwise embodied without departure from the spirit and scope
55 thereof.

In said drawings:

Fig. 1 is a side elevation of substantially the complete machine.

Fig. 2 is a plan view, partly broken away, 70 of the bed, belt, and associated devices.

Fig. 3 is an enlarged side elevation of the yielding belt take-up, showing the parts in the positions assumed under tension.

The machine shown in Figs. 1 and 2 comprises an elongated bed 10 carried by suitable supports 11 and over which is adapted to travel, on suitable ways supported thereon, a carriage 12 having rotating foraminous drums or other means, indicated at 13, for showering the mica flakes on the bed, means, indicated at 14, for supplying adhesive binder in liquid form, and rollers 15 for rolling the flakes and binder on the bed as said carriage travels over the latter. Overlying the bed
85 10, and constituting a receiving member for the flakes and binder on which the former are united by the latter into composite sheets, is a flexible belt 16 which passes about guide rollers 17 at the ends of the bed, the ends
90 of said belt being wound upon drums or reels 18 and 19 respectively. One end of the bed, in the present instance the end shown at the right in Fig. 1, is the discharge or delivery end, and adjacent the guide roller 17 at
95 that end is a suitable cutter 20 for dividing the finished sheets into sections which may be discharged into a suitable tray or other receiver 21. The reel 18 is located adjacent the delivery end of the machine and may be 100

driven, as by a belt 22, from any suitable source of power (not shown) under the control of a clutch 23. The reel 19, as shown, is driven by an electric motor 24, the controlling switch for which may also be conveniently located adjacent the delivery end of the machine.

In operation, when the mica flakes have been deposited to the desired depth upon the belt 16 and united into a composite sheet of the desired thickness, the travel of the carriage 12 is stopped and the finished sheet discharged. To this end, the clutch 23 is operated to cause the reel 18 to draw the belt 16 over the roller 17 at the delivery end of the bed, this abrupt bending of the belt causing the sheet to leave the same and extend into the receiver 21. The clutch 23 is then released and the cutter 20 operated to cut off a section of the sheet, and these operations repeated until the entire sheet has been discharged and cut up into sections of convenient size. The reel 19 is then operated by the motor 24 to rewind the belt and restore it to its original position on the bed 10.

Except as hereinafter pointed out, the parts above mentioned may all be substantially as more fully shown and described in the prior application above referred to.

In accordance with the present invention, the belt 16 comprises an operative or sheet receiving portion 25, corresponding substantially in length and width to the bed 10, and extensions 26 and 27, preferably of reduced width, constituting flexible connectors between the operative portion of the belt and the reels 18 and 19 respectively. The length of each extension 26 and 27 is approximately equal to the length of the operative portion 25, and consequently to the length of the bed 10, so that the total length of the belt is approximately three times that of said operative portion and bed. When the belt is in its normal or operative position overlying the bed, as shown in Fig. 2, the portion or extension 27 thereof is substantially completely wound upon the reel 19, while the portion or extension 26 will be substantially completely unwound, the latter portion, which intervenes between the reel 18 and the corresponding end of the bed, being substantially equal to the length of the operative portion and of the bed. When the reel 18 is operated to draw the belt over the bed and discharge the sheet, the portion 26 only of said belt will be wound on said reel, and the forward end of the operative portion 25 will not reach said reel until the rear end of said operative portion has been brought to the delivery end of the bed and the sheet completely discharged. Similarly, when the reel 19 is operated to return the belt to normal position, the portion 27 only of the belt is wound upon said reel. It will therefore be seen that, while the reels 18 and 19 operate effectually to move the belt in the

desired manner, the operative portion of said belt is at no time wound upon said reels, so that transfer of the accumulated adhesive binder from the upper to the lower surface thereof, as well as adhesion between the belt and bed, is effectually prevented.

In order that the reel 18 may be located in a convenient position adjacent the delivery end of the machine, the portion 26 of the belt between said reel and the adjacent guide roller 17 may, as shown, be guided over a roller 28 in two approximately parallel stretches beneath the bed. In view of the added length of the belt, and for the purpose of holding the latter suitably taut, while preventing undue strains thereon due to the sudden starting and stopping of the reel 18 by the clutch 23, a suitable yielding take-up is preferably provided. As shown, the bottom stretch of the portion 26 of the belt passes over a series of guide rollers 29 between two of which it is deflected by a yieldingly mounted take-up roller 30. Each end of the roller 30 is guided between a pair of vertical posts 32 which rise from a suitable base 34 and are connected at their tops by a fixed cross-head 35. Above the roller 30 is a slide or movable cross-head 36 guided on the posts 32 and between which and the fixed cross-head 35 are interposed springs 31 mounted on said posts. A second slide or movable cross-head 37 is guided on the posts 32 below the roller 30 and is supported by springs 33 on said posts and interposed between said cross-head and the base 34. When the belt 16 is at rest, and as shown in Fig. 1, the ends of the roller 30 are supported on the cross-heads 37 and support the cross-heads 36. When the reel 18 is suddenly started, the resulting tension on the belt causes the latter to lift the roller 30 and cross-heads 36, this movement being yieldingly checked, and the strain on the belt being consequently cushioned, by the springs 31. When the reel is stopped, the resulting slack in the belt is taken up by downward movement of the roller 30, the descent of the latter being cushioned by the springs 33.

Having thus described my invention, I claim:

1. In a machine for forming composite sheets by the use of an adhesive binder, a bed, a flexible belt normally overlying said bed and on which the sheets are formed, and a reel on which said belt is wound to draw the same over said bed, said belt being of sufficient length to permit the operative portion thereof on which the sheets are formed to be completely withdrawn from said bed without winding any of said operative portion upon said reel.

2. In a machine for forming composite sheets by the use of an adhesive binder, a bed, a flexible belt normally overlying said bed and on which the sheets are formed, and a reel on which said belt is wound to draw the

same over said bed, said belt having a portion extending between said bed and reel of sufficient length to permit the operative portion thereof on which the sheets are formed to be completely withdrawn from said bed without winding any of said operative portion upon said reel.

3. In a machine for forming composite sheets by the use of an adhesive binder, a bed, a flexible belt normally overlying said bed and having an operative portion on which said sheets are formed, and winding means for drawing said belt over said bed, said belt having an extension of approximately the length of the operative portion thereof and cooperating with said winding means.

4. In a machine for forming composite sheets by the use of an adhesive binder, a bed, a flexible belt normally overlying said bed and on which said sheets are formed, and a reel on which said belt is wound to draw the same over said bed, the portion of said belt extending between said reel and the end of said bed being approximately equal in length to the length of said bed.

5. In a machine for forming composite sheets by the use of an adhesive binder, a bed, a flexible belt normally overlying said bed and on which said sheets are formed, a reel on which said belt is wound to draw the same over said bed, the portion of said belt between said reel and the end of said bed being approximately equal in length to the length of said bed, and means for guiding said belt in approximately parallel stretches beneath said bed.

6. In a machine for forming composite sheets by the use of an adhesive binder, a bed, a flexible belt normally overlying said bed and on which said sheets are formed, winding means for drawing said belt in one direction over said bed to discharge the finished sheets, and winding means for returning said belt to normal position, the length of said belt between said winding means being approximately three times the length of said bed.

7. In a machine for forming composite sheets by the use of an adhesive binder, a bed, a flexible belt normally overlying said bed and on which said sheets are formed, a reel on which said belt is wound to draw the same over said bed, the portion of said belt between said reel and said bed being approximately equal in length to the length of said bed, a clutch for controlling the operation of said reel, means for guiding said belt in approximately parallel stretches beneath said bed, guide rollers for one of said stretches, and a spring cushioned roller engaging said belt between two of said guide rollers.

In testimony whereof I affix my signature.

LOUIS McCARTHY.