May 24, 1938. A. G. LEONARD, JR 2,118,762

MACHINE FOR MAKING TAPERED CEMENT ASBESTOS SHINGLES

Filed July 3, 1936 2 Sheets-Sheet 1

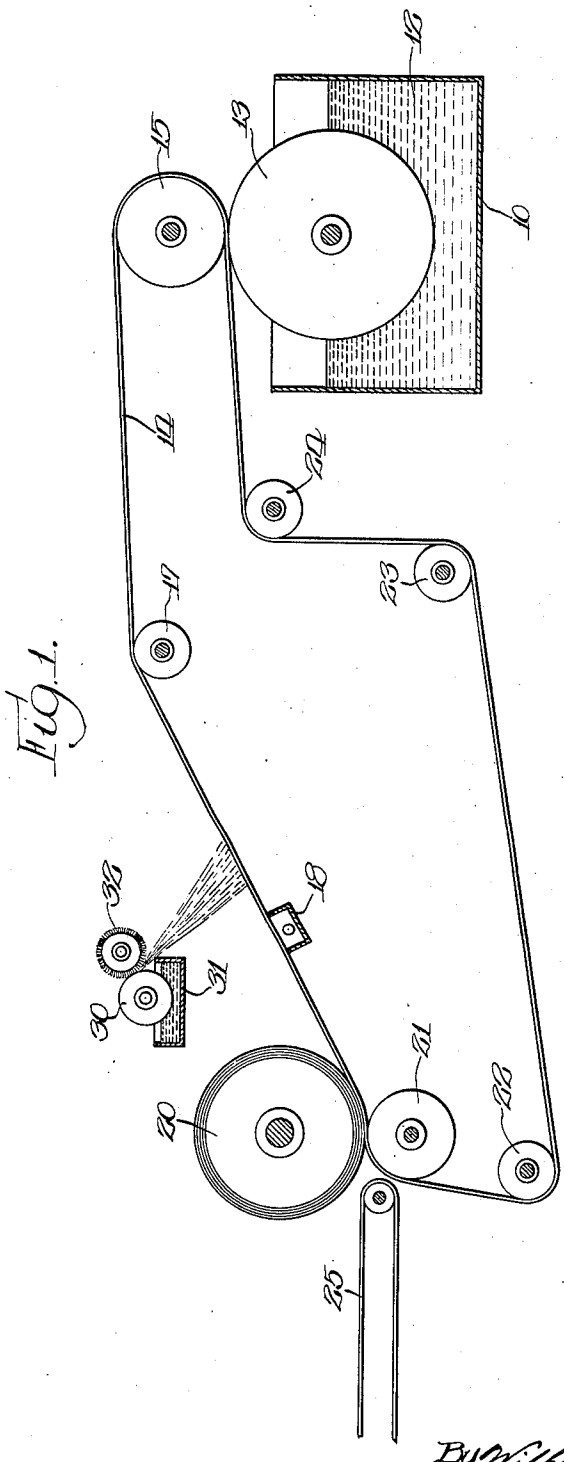


Fig. 1.

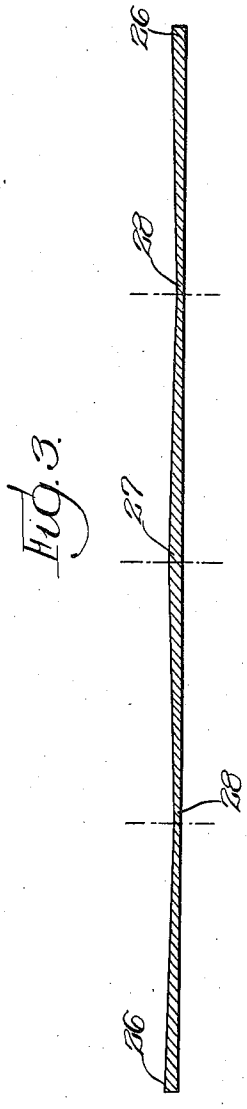


Fig. 3.

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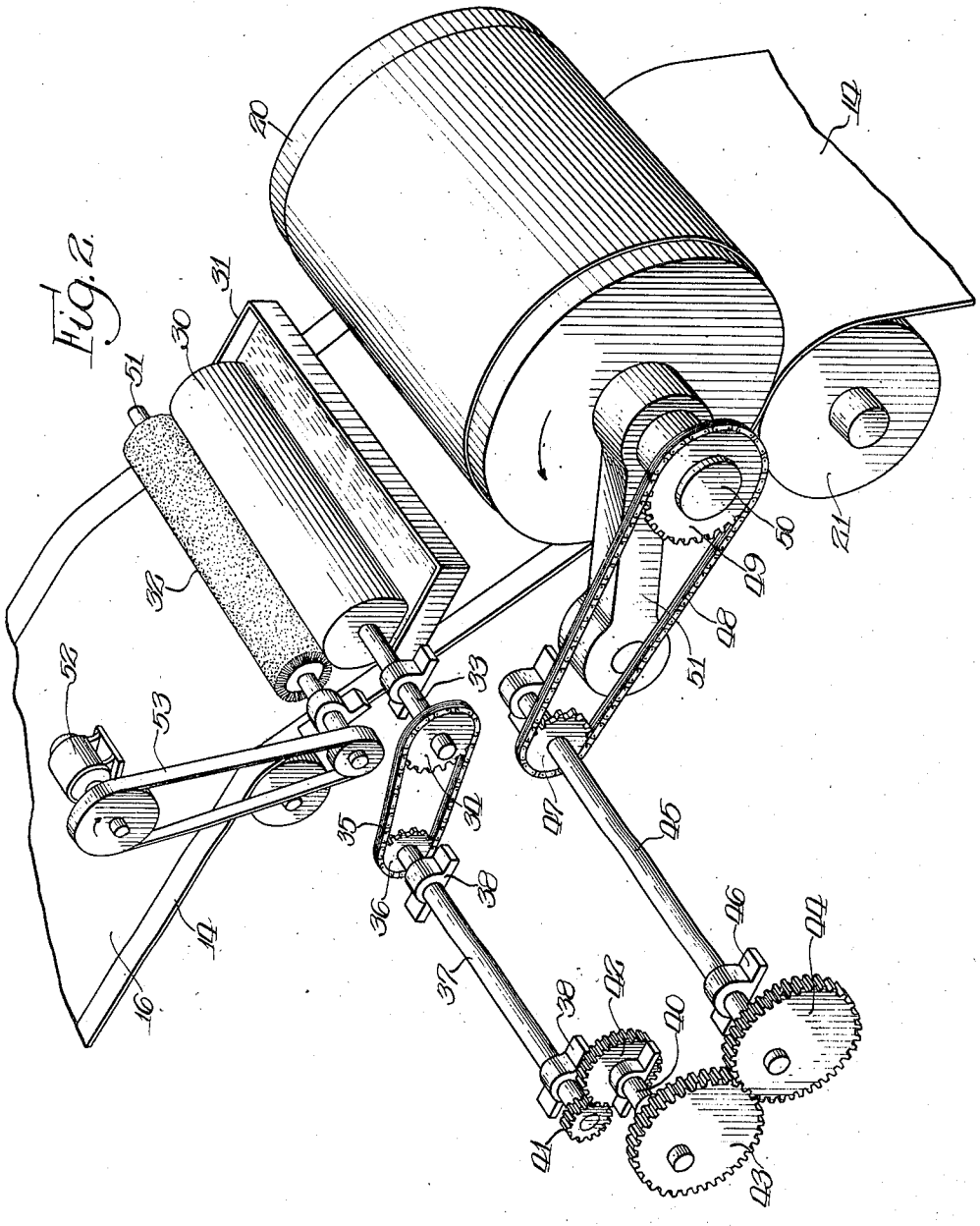

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Fig. 2.




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Patented May 24, 1938 2,118,762

# UNITED STATES PATENT OFFICE

2,118,762

## MACHINE FOR MAKING TAPERED CEMENT ASBESTOS SHINGLES

Arthur G. Leonard, Jr., Wilmington, Ill., assignor, by mesne assignments, to The Lehon Company, Chicago, Ill., a corporation of Illinois

Application July 3, 1936, Serial No. 88,759

14 Claims. (Cl. 92—41)

The invention relates to apparatus for making asbestos shingle stock or any similar material which is formed by the accumulation of successive layers and has particular reference to a method of and novel apparatus for making shingle stock of tapering form.

The invention is particularly concerned with the making of shingle stock from asbestos fibers and cement which is transferred as a wet mixture to an endless cloth band by an operation known as couching in the paper making art and which forms a relatively thin layer or web of the cement asbestos mixture on the endless cloth band. As shown in my Patent No. 2,010,308 granted August 6, 1935 an accumulation roll is used on which the wet paper-like web of the cement asbestos mixture is accumulated until the desired thickness is secured, whereupon the plyboard thus formed is stripped from the roll and delivered to the conveying means.

After the plyboard has been subjected to pressure to force out most of the water and then dried a very satisfactory stock for shingles is secured, which, however, is of uniform thickness throughout.

It is an object of the invention to produce shingle stock of cement and asbestos which will taper in one direction so that the resulting shingles may have a relatively thick butt end. The method contemplated by the invention for making tapering cement-asbestos stock consists in forming in the usual manner a wet paper-like web of the cement asbestos mixture which will be uniform in thickness. Before the web is delivered to the accumulation roll a wet cement mixture is applied to the upper surface of the web in quantities which vary from a maximum to a minimum within a certain length of the web, determined by the radius of the accumulation roll.

Therefore, another object of the invention is to provide novel distributing means which will spray a wet cement mixture on the travelling cement-asbestos web and which will alternately accelerate to a maximum speed and then decelerate in timed relation with the travel of the web.

With these and various other objects in view the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings which illustrate an embodiment of the invention and wherein like reference characters are used to designate like parts—

Figure 1 is a diagrammatic view illustrating apparatus for forming ply-board in accordance with the invention;

Figure 2 is a fragmentary perspective view showing the distributing apparatus and operating means therefor for applying the wet cement mixture to the web; and

Figure 3 is a longitudinal sectional view of the shingle stock as stripped from the accumulation roll, showing the tapering formation of the same.

The apparatus for producing the tapering plyboard of the invention consists of a vat or container 10, Figure 1, for the cement-asbestos mixture 12, a considerable proportion of the mixture being water so that the same can be readily transferred from a mixing tank, not shown, to the vat 10. Rotatably journalled within the vat 10 is a drum 13 having a periphery formed by a fine wire mesh fabric. A section of the periphery of the drum is subjected to vacuum to cause the mixture in tank 10, that is, the asbestos fiber and cement, to adhere to the wire fabric forming a relatively thin coat on the exterior of the drum. The character of drum above described is well known and the operation of transferring the material adhering to the wire fabric is known as couching.

The endless belt 14 is suitably supported by roller 15 located directly over the drum 13 so that the band contacts the periphery of the drum and picks up the coating which is deposited on the band as a wet paper-like web indicated in Figure 2 by numeral 16. The web travels over a small supporting roller 17, over the vacuum means 18, which removes from the web excess moisture before the web is deposited on the accumulation roll 20. The band passes between the accumulation roll 20 and the lower supporting roller 21 and around small rollers 22, 23 and 24, respectively, when the band again functions to remove the web from the drum 13.

The said paper-like web of asbestos fibers and cement is picked up by the accumulation roll 20 and is accumulated on the roll until the desired thickness is secured, whereupon the plyboard produced is severed and stripped from the roll. The conveyor 25 conveys the plyboard to hydraulic means, not shown, where the same is pressed to squeeze out the remaining moisture and is subsequently cut into shingle size and dried.

The apparatus above described will produce plyboard of uniform thickness, whereas, the plyboard of the invention is of tapering form, as shown in Figure 3, which is a strip as removed


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from the accumulation roll. The respective ends 26 of said strip and the center 27 have the maximum thickness which tapers toward the points 28 of minimum thickness. The mechanism for applying a coating to the cement-asbestos web to produce the tapering formation is more particularly shown in Figure 2 and consists of a fountain or supply roller 30 suitably journalled for rotation within the fountain 31, and a distributing roller 32 which is rotated at a relatively high peripheral speed compared to the surface speed of roller 30 to spray the cement mixture onto the web 16.

The fountain 31 is supplied with a wet cement mixture which is picked up by the roller 30 and due to the greater peripheral speed of the distributing roller is discharged from roller 30 and in effect sprayed onto the cement-asbestos web. The distributing roller is suitably journalled by shaft 51 and is rotated by motor 52 through the belt 53 which connects pulleys on the respective members.

The fountain roller 30 is suitably supported by shaft 33 which is fixed to gear 34 operatively connected by chain 35 with gear 36 fixed to counter-shaft 37. Bearings 38 journal said counter-shaft which is connected with shaft 40 by pinion 41 and gear 42 on the shafts respectively. The elliptical gear 43 meshes with a similar gear 44 fixed to drive shaft 45 suitably journalled by members 46. Fixed to this shaft is a gear 47 operatively connected by the chain 48 and gear 49 with shaft 50 carrying the accumulation roll 20. The shaft of the accumulation roll is suitably journalled by arms 51 and said roll is driven by structure not disclosed since the same forms no part of the present invention. Thus the fountain or supply roller 30 is driven by the accumulation roll 20, the drive including the elliptical gears 43 and 44 which have operation automatically to vary the speed of rotation of the supply roller, it being understood, of course, that the accumulation roll is driven at a constant speed. Whatever the speed of the supply roller some of the wet cement mixture in fountain 31 will be picked up by the surface of said roller and supplied to the distributing roller 32. Said distributing roller is formed of a plurality of radially extending wires of uniform length. The material picked up by the surface of the supply roller is in effect sprayed onto the web 16, the amount applied being greater when the speed of the supply roller 30 is a maximum. In this manner certain portions of said web are increased in thickness, thus producing the tapering formation of the shingle stock on the accumulation roll.

The elliptical gears 43 and 44 in the drive from the accumulation roll to the supply roller 30 are so designed that said roller will rotate at varying speeds, alternating from a maximum speed to a minimum speed within a certain length of travel of the web 16. During maximum speed of the supply roller the greatest amount of said material is applied to the web 16 and during the minimum speed of said roller very little, if any, material is applied. Therefore, the web delivered to the accumulation roll has a varying thickness. The maximum and minimum speeds of the supply roller 30 occur in timed relation to the travel of the web, since said roller is driven by the accumulation roll. More particularly, the drive, including the elliptical gears 43 and 44, is designed so that the supply roller will complete a cycle of operations during the travel of a length of the web equal to one-half the circumference of the accumulation roll. Expressed in other words, the roller will complete two cycles during the travel of a length of web equal to the entire circumference of the accumulation roll. A cycle includes a minimum and a maximum speed of operation which occur periodically and therefore the portions of the web of increased thickness will be spaced a uniform distance. Thus, when the web is wound on the accumulation roll the thick portions will coincide and also the thin portions will be in alignment.

As the web continues to accumulate on the roll 20 the surface of the same gradually assumes a wavy outline produced by the sections of the web of increased thickness with respect to other sections, which are considerably thinner as the result of the reduced speed of rotation of the roller 30. When the accumulated material on the roll 20 has reached the desired average thickness the same is automatically severed and stripped from the roll, whereupon the length of plyboard produced is conveyed by the means 25 to other apparatus for squeezing out the excess moisture, drying the same, and finally cutting the stock into shingles.

As will be evident from Figure 3, each length of plyboard as stripped from the accumulation roll has two portions of increased thickness which were diametrically opposite when the stock was on the roll. In a like manner the same has two portions of minimum thickness, also diametrically opposite when on the accumulation roll. The production of shingles of tapering thickness requires that the stock be severed along the dotted lines, as shown in Figure 3, which will divide the length of stock into four sections of equal length and wherein each section will have one edge of maximum thickness and the opposite edge of minimum thickness.

The invention is not to be limited to or by details of construction of the particular embodiment thereof illustrated by the drawings, as various other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. In apparatus for making shingle stock of tapering formation from an asbestos mixture, the combination with a roll on which said stock is formed by the accumulation of several layers of web formed from said mixture, of means for applying a cement coating to one surface of the web at spaced locations along the length thereof, said coatings increasing the thickness of said web and being spaced so that two coatings occur within a length of web equal to the circumference of the accumulation roll.

2. In apparatus for making shingle stock of tapering formation from an asbestos mixture, the combination with a roll on which said stock is formed by the accumulation of several layers of web formed from said mixture, of means for applying a cement coating to one surface of the web at spaced locations along the length thereof, said coatings increasing the thickness of said web at the locations, and means driving said coat applying means from the accumulation roll.

3. In apparatus for making shingle stock of tapering formation from an asbestos mixture, the combination with a roll on which said stock is formed by the accumulation of several layers of web formed from said mixture, of means for applying a cement coating to one surface of the web at spaced locations along the length thereof, said coating increasing the thickness of said web


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at the locations, and means driving said coat applying means in timed relation to the travel of the web to thereby thicken the web at points which are equi-distant apart.

4. In apparatus for making shingle stock of tapering formation from an asbestos mixture, the combination with a roll on which said stock is formed by the accumulation of several layers of web formed from said mixture, of means for applying a cement coating to one surface of the web at spaced locations along the length thereof, to thereby increase the thickness of the web at said locations, said means including a supply roller having rotation at varying speeds, and a distributing roller contacting the periphery of the supply roller.

5. In apparatus for making shingle stock having a tapering formation, the combination with a roll on which said stock is formed by the accumulation of several layers of web having the same composition as said stock, of means for applying a coating to one surface of the web at spaced locations along its length to increase the thickness thereof at said locations, said means including a supply roller, and a distributing roller contacting the periphery of the supply roller, said supply roller rotating at varying speeds and said distributing roller at all times rotating at a higher peripheral speed than said supply roller.

6. In apparatus for making shingle stock having a tapering formation, the combination with a roll on which said stock is formed by the accumulation of several layers of web having the same composition as said stock, of means for applying a coating to one surface of the web at spaced locations along its length to increase the thickness thereof at said locations, said means including a supply roller, and a distributing roller contacting the periphery of the supply roller, said supply roller being driven at varying speeds from the accumulation roll.

7. In apparatus for making shingle stock having a tapering formation, the combination with a roll on which said stock is formed by the accumulation of several layers of web having the same composition as said stock, of means for applying a coating to one surface of the web at spaced locations along its length to increase the thickness thereof at said locations, said means including a supply roller and a distributing roller contacting the periphery thereof, said supply roller rotating at speeds which periodically vary between a minimum and a maximum and said rollers at all times rotating at different peripheral speeds.

8. Apparatus for making shingle stock of tapering formation comprising an accumulation roll on which said stock is formed by the accumulation of several layers of web having the same composition as said stock, coating means for spraying a coating on one surface of the web at spaced locations along its length to increase the thickness thereof at said locations, said means including a supply roller and a distributing roller contacting the periphery thereof, and driving means for the supply roller, said driving means rotating the supply roller at varying speeds.

9. Apparatus for making shingle stock of tapering formation, comprising an accumulation roll on which said stock is formed by the accumulation of several layers of web having the same composition as said stock, coating means for spraying a coating on one surface of the web at spaced locations along its length to increase the thickness thereof at said locations, said means including a supply roller and a distributing roller contacting the periphery thereof, and means driving the supply roller from the accumulation roll at speeds periodically varying between a minimum and a maximum.

10. Apparatus for making shingle stock of tapering formation from asbestos mixture, comprising an accumulation roll on which said stock is formed by the accumulation of several layers of web formed from said asbestos mixture, coating means for spraying a coating of cement on one surface of said web at spaced locations along its length to increase the thickness thereof at said locations, said means including a supply roller and a distributing roller contacting the periphery thereof, means driving said supply roller from the accumulation roll at speeds periodically varying between a minimum and a maximum, and means rotating said distributing roller at a substantially constant speed, said rollers at all times rotating at different peripheral speeds.

11. Apparatus for making shingle stock of tapering formation from asbestos mixture, comprising an accumulation roll on which said stock is formed by the accumulation of several layers of web formed from said asbestos mixture, coating means for spraying a coating of cement on one surface of said web at spaced locations along its length to increase the thickness thereof at said locations, said means including a supply roller and a distributing roller contacting the periphery thereof, means driving said supply roller from the accumulation roll at speeds periodically varying between a minimum and a maximum, and other means rotating said distributing roller at a greater peripheral speed than said supply roller.

12. Apparatus for making shingle stock of tapering formation from asbestos mixture, comprising an accumulation roll on which said stock is formed by the accumulation of several layers of web formed from said asbestos mixture, coating means for spraying a coating of cement on one surface of said web at spaced locations along its length to increase the thickness thereof at said locations, said means including a supply roller and a distributing roller contacting the periphery thereof, a drive for rotating said supply roller including means for varying the speed of said roller, and other means for rotating the distributing roller at a higher speed than the supply roller.

13. Apparatus for making shingle stock of tapering formation from asbestos mixture, comprising an accumulation roll on which said stock is formed by the accumulation of several layers of web formed from said asbestos mixture, coating means for spraying a coating of cement on one surface of said web at spaced locations along its length to increase the thickness thereof at said locations, said means including a supply roller and a distributing roller contacting the periphery thereof, a drive for rotating said supply roller from the accumulation roll including means operative to periodically vary the speed of said supply roller between a minimum and a maximum, and other means for rotating said distributing roller at a higher peripheral speed than said supply roller.

14. Apparatus for making shingle stock of tapering formation from an asbestos mixture, comprising an accumulation roll on which said stock is formed by the accumulation of several layers of web formed from said asbestos mixture, coating means for spraying a cement coating on one surface of the web at spaced locations along its

length to increase the thickness thereof at said locations, said means including a supply roller, a fountain containing the coating composition and journalling said supply roller, and a distributing roller having contact with the periphery of the supply roller, a drive for rotating said supply roller from the accumulation roll including means operative to periodically vary the speed of said roller between a minimum and a maximum, and other means rotating said distributing roller at a relatively high peripheral speed.

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