Sept. 27, 1927. 1,643,373

A. L. CLAPP

METHOD AND MECHANISM FOR MAKING TAPERED SHINGLES

Filed March 7, 1924 2 Sheets-Sheet 1

Fig. 1.

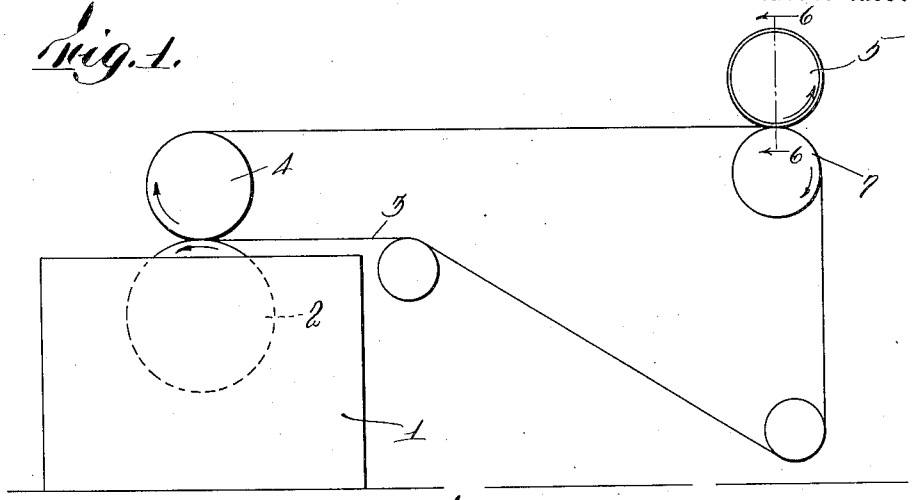
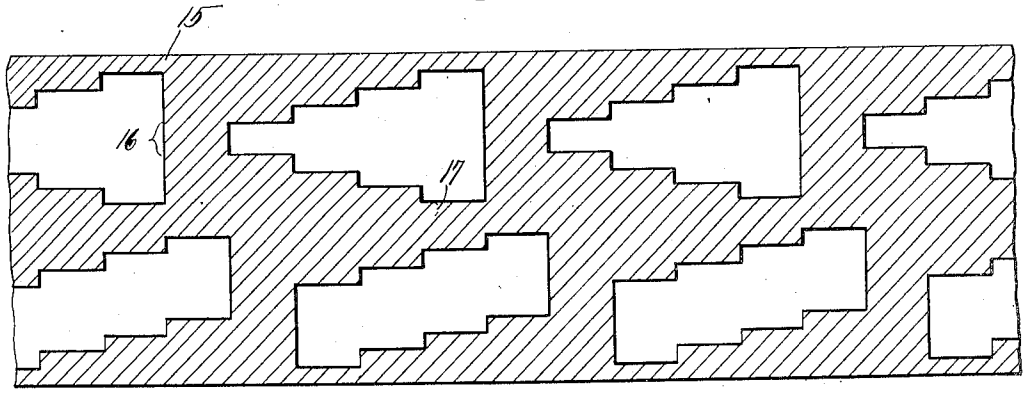


Fig. 2.



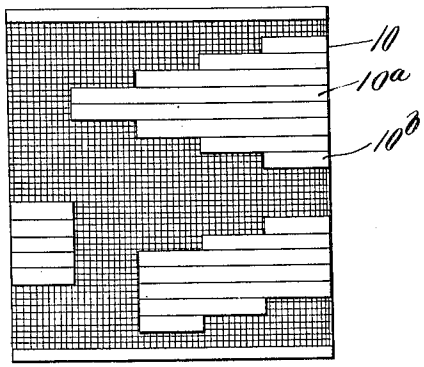


Fig. 3.

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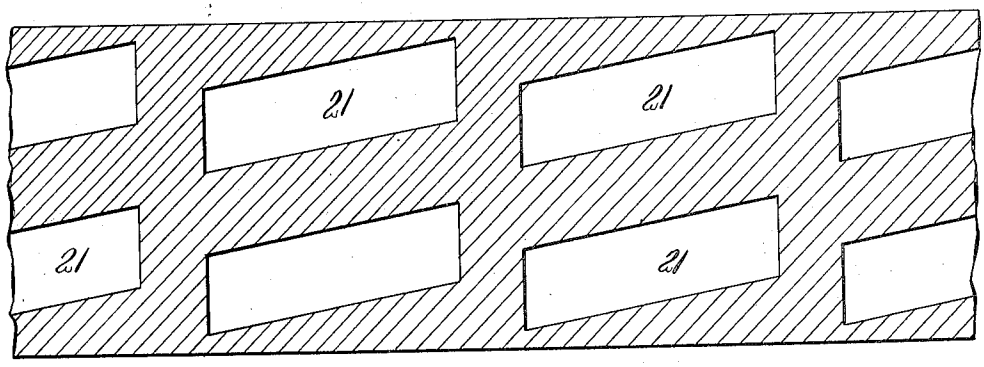


Fig. 4.

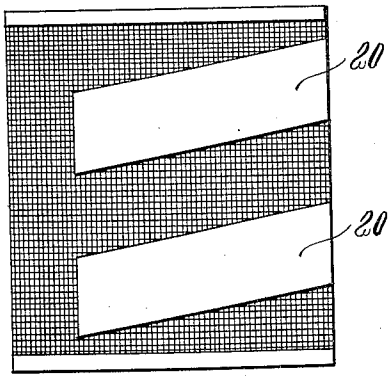


Fig. 5.

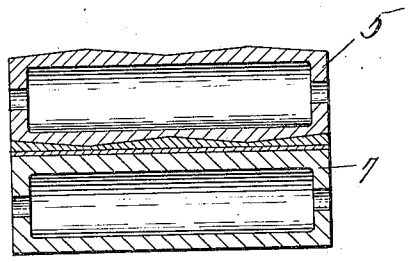


Fig. 6.

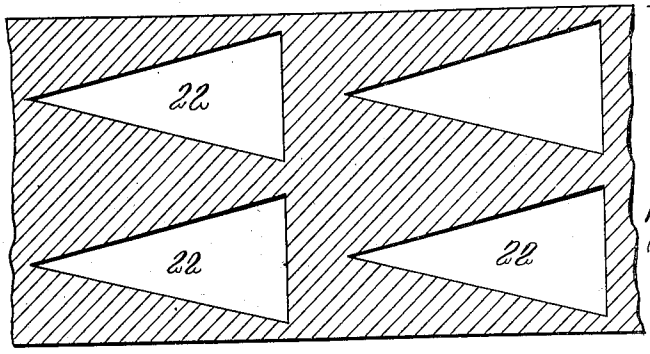


Fig. 7.

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UNITED STATES PATENT OFFICE.

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METHOD AND MECHANISM FOR MAKING TAPERED SHINGLES.

Application filed March 7, 1924. Serial No. 697,488.

Roofing material as now commonly made from felted fibrous material, such as rag felt saturated with waterproofing material as asphalt, with or without a surfacing of granular material, as crushed slate, is of substantially uniform thickness. Where such material is laid in overlapping courses it must be somewhat flexible in order to lie tight to the roof, the upper edge of each course engaging the roof foundation and then bending up and over the upper edge of the underlying course and then flat against its upper face. In order that substantially rigid roofing elements, such for example as wood shingles, may be laid in overlapping courses and lie flat, it is necessary to form them tapering in thickness, the thin edges being uppermost and forming no sudden rises over which the units of the overlying course must pass and then be bent down to lie flat against the upper faces of the underlying units. As ordinarily constructed a paper machine is incapable of forming sheet material tapered in thickness and hence heretofore it has been necessary where roofing material is to be formed on a paper machine to form this material flexible. Flexible material, however, has the disadvantage that the portion exposed to the weather is liable to be bent upwardly, permitting rain to drive up under and impairing its weather-proofing capabilities.

This invention, therefore, provides a method and machine by which a stiff waterproof board, such for example, as that described and claimed in my application, Serial No. 662,225, filed September 12, 1923, for shingle material and method of manufacture may be formed tapered in thickness on a wet paper machine so that it is well adapted for weatherproofing purposes and may be laid flat down in the same manner as ordinary tapered wood shingles.

This may be done by preventing the cylinder mold from picking up pulp to be deposited on the blanket over certain portions of its periphery, these portions varying in circumferential extent axially across the cylinder mold. This may be done conveniently by using deckle strips or bands so as to cover those portions of the periphery of the cylinder mold on which it is not desired that the pulp be deposited.

For a more complete understanding of this invention, reference may be had to the accompanying drawings in which

Figure 1 is a diagrammatic side elevation of a paper machine.

Figure 2 is a plan of a portion of the blanket showing two manners in which the pulp may be deposited thereon from the pick up roll.

Figure 3 is a development of a cylinder mold showing the deckle strips fixed thereto in position to form the deposits illustrated in Figure 2.

Figures 4 and 5 are views similar to Figures 2 and 3 but showing still another manner of applying the deckle strips and depositing the pulp on the blanket.

Figure 6 is a cross section through the make up roll and the corresponding couch roll.

Figure 7 is a view similar to Figures 2 and 4, but illustrating still another manner in which the pulp may be deposited on the blanket.

Referring to Figure 1, 1 indicates diagrammatically the vat of a paper machine in which the usual cylinder mold 2 revolves and over which a blanket 3 passes on which the pulp picked up by the cylinder mold is deposited, this blanket passing over the roll 4 and carrying the pulp on its upper face to the make up roll 5 on which the pulp is wound to form a board of the desired caliper and from which it is cut and stripped to form the board. The blanket passes over the end couch roll 7 and returns into operative relation to the pick-up roll in the usual manner. Since in the present instance it is desired to deposit the pulp irregularly across the width of the blanket, the cylinder mold is so formed that more pulp is picked up at certain portions thereof than at others. This may be accomplished by covering certain areas of the periphery of the cylinder mold so that the pulp will not be picked up thereon and this may be conveniently accomplished by the use of the deckle strips which comprise strips of fabric or felt which are ordinarily made

fast to the cylinder mold circumferentially to determine the width of the web of pulp which is to be picked up. Such deckle strips may be cut to any length desired so as to cover any circumferential portion of the mold and are placed between the usual deckle strips which extend completely around the circumference of the cylinder mold adjacent to each end.

In order to form a tapered board they may be attached to the periphery of the mold as shown for example in the upper portion of Figure 3. Referring to this figure it will be seen that a series of deckle strips 10 are arranged side by side, these strips varying in length being of gradually increasing length from the upper strip 10 to the strip 10^a and then from the next adjacent strip being of gradually decreasing length to the strip 10^b. The pulp will then be deposited over those portions of the cylinder mold not covered by the deckle strips, the portion above the upper deckle strip 10 being deposited thereon continuously as shown throughout the zone 15 of Figure 2, the pulp being deposited discontinuously and in gradually decreasing lengthwise extents down to the zone 16. The deposits then gradually increase in length, being deposited for a longer proportion of the time of each complete rotation of the cylinder until the zone 17 is reached where the deposit is again continuous. Instead of arranging the deckle strips as shown in the upper portion of this figure, the same result may be accomplished by arranging them as shown in the lower half of Figure 3, the same relative extents of deposit on the various zones being produced at each revolution of the cylinder mold but in a different pattern formation on the blanket.

In Figures 4 and 5 a still different pattern formation is shown which is produced by arranging either deckle strips or comparatively wide bands 20 of similar material diagonally on the surface of the cylinder mold, producing diagonally arranged areas 21 corresponding to the strips 20 in which no pulp is deposited on the blanket.

In Figure 7 still another pattern formation is shown in which the areas over which the pulp is not deposited are in the form of triangles 22. In each form, however, the web of pulp has openings of predetermined configuration recurring regularly therein.

The end couch roll 7 is of the usual cylindrical type of uniform diameter over which the blanket passes without any stretching or distortion. The make up roll, however, as shown best in Figure 6 is formed tapering corresponding to the amount of material deposited on the blanket transversely thereof.

While the pattern formations of Figures 2 and 3 tend to produce deposits of pulp on the cylinder mold varying in thickness by definite increments the pressure exerted on the make up roll is sufficient to render this unnoticeable in the product. The pattern formations of Figures 4, 5, and 7, however, deposit the pulp in such a manner that no definite increments are produced, there being a gradual change in the amount of the deposit axially of the make up roll.

When sufficient of the pulp has been deposited on the make up roll to form the sheet to the desired thickness, it is cut from the roll axially and removed therefrom and spread out in the form of a flat sheet in the usual manner. This sheet may then be cut along the lines of greatest and least thicknesses and transversely thereof to form shingle elements which are tapered in thickness from end to end.

Having thus described certain embodiments of this invention it should be evident to those skilled in the art that many changes and modifications might be made therein without departing from its spirit or scope as defined by the appended claims.

I claim:

1. The method of forming a fiberboard of variable thickness, which comprises picking up fibrous pulp on a cylinder mold having portions only of its surface capable of receiving the pulp, winding up the pulp so picked up on a make up roll cutting the wound pulp axially of the make-up roll and removing it therefrom.

2. The method of forming a fiberboard of variable thickness, which comprises picking up fibrous pulp on a cylinder mold having portions of its circumference variable in extent axially of said mold formed to prevent the pulp from being picked up thereon, winding up the pulp so formed on a make up roll cutting the wound pulp axially of the make-up roll and removing it therefrom.

3. The method of forming a fiberboard of variable thickness, which comprises picking up fibrous pulp on a cylinder mold having portions of its circumference variable in extent axially of said mold formed to prevent the pulp from being picked up thereon, depositing the pulp so picked up in a non-continuous layer on a blanket, winding up the pulp from the blanket on a make up roll cutting the wound pulp axially of the make-up roll and removing it therefrom.

4. The method of forming a fiberboard of variable thickness, which comprises picking up fibrous pulp on a cylinder mold having portions of its circumference variable in extent axially of said mold formed to prevent the pulp from being picked up thereon, depositing the pulp so picked up in a non-continuous layer on a blanket, and winding up the pulp from the blanket on a make up roll having the diameter of its periphery variable axially to correspond with the amount of pulp to be deposited thereon.

5. The method of forming a fiberboard tapered in thickness, which comprises picking up fibrous pulp and depositing it into a sheet in zones arranged crosswise of the sheet and collecting it to form a board, the length of time during which pulp is deposited in such zones differing from zone to zone, whereby the portions of the board formed from the zones in which the time of deposit is longer are thicker than those portions formed from the zones in which the time of deposit is shorter.

6. A cylinder mold for paper machines having portions of its area between the usual deckle strip surfaced to prevent pulp from being picked up thereon, said portions being of progressively variable length circumferentially of the roll axially thereof.

7. A cylinder mold for paper machines having deckle strips made fast thereto side by side between its end margins, said strips covering areas of progressively variable length circumferentially of the roll arranged axially thereof.

8. A cylinder mold for paper machines having a series of deckle strips made fast thereto side by side and extending circumferentially thereof, said strips being of progressively variable length laterally of the series.

9. A cylinder mold for paper machines having a series of deckle strips made fast thereto side by side and extending circumferentially thereof, said strips being of progressively variable length laterally of the series and each of less length than the circumference of the roll.

10. The method of forming a fiberboard of variable thickness, which comprises forming a web of pulp having openings of predetermined configuration recurring regularly therein, winding the web on a make-up roll, cutting the wound pulp axially of the roll, and removing it therefrom.

11. The method of forming a fiberboard of tapered thickness, which comprises forming a web of pulp having openings therein of progressively variable width recurring regularly therein, winding the web on a make-up roll, cutting the wound pulp axially of the roll, and removing it therefrom.

In testimony whereof I have affixed my signature.

ALBERT L. CLAPP.