

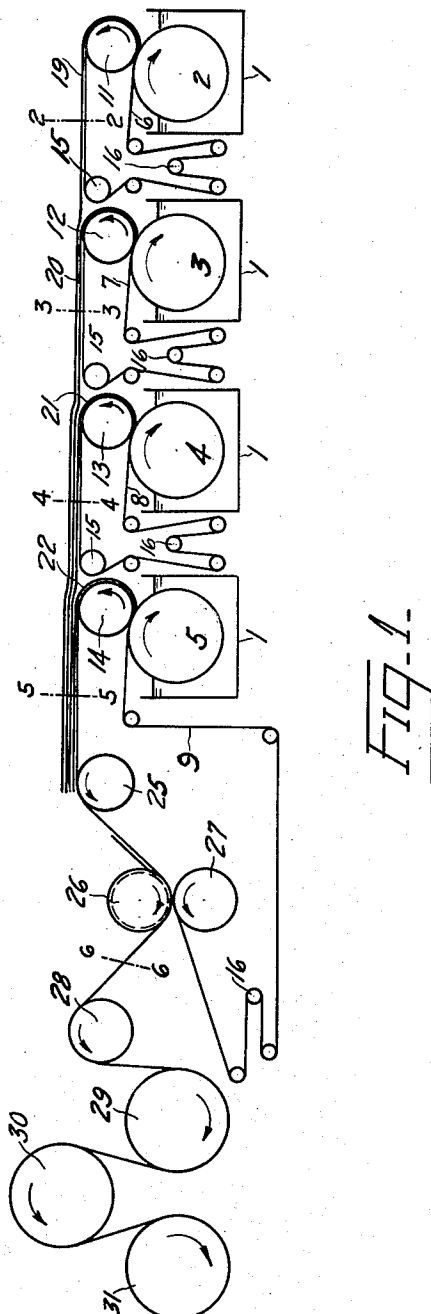
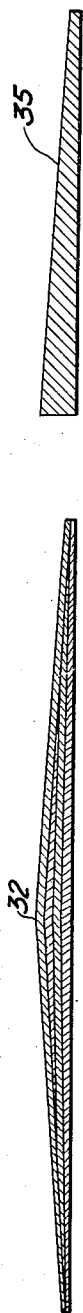
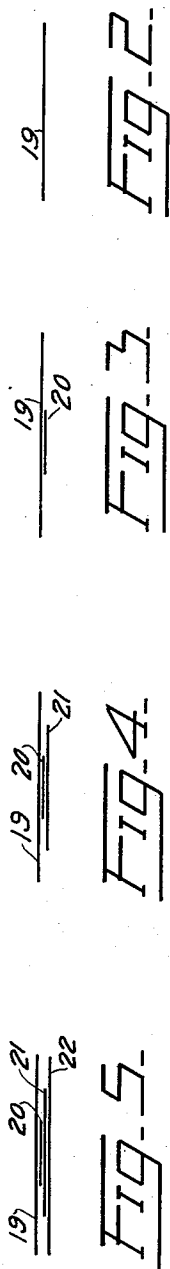
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THICK BUTT SHINGLE AND PROCESS OF MAKING SAME

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THICK BUTT SHINGLE AND PROCESS OF MAKING SAME

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This invention relates to surfacing materials such as roof or wall surfacings, shingles, shingle strips and the like, and more particularly to a process for producing tapered shingle strips and tapered shingles, and to such shingles.

An object of this invention is to provide a process that can be practiced in the usual multi-cylinder paper making machines to produce a sheet of varying thickness transversely of its length. This sheet can then be treated in well known types of roofing machines to produce tapered shingles which simulate in contour the common wood shingle and thick butt shingles. Another object is to produce a surfacing, shingle strip or shingle which affords many advantages over prepared surfacing, as heretofore produced.

Heretofore, tapered shingles or shingle strips, or surfacings of varying thickness have been made by molding the waterproof material such as asphalt by means of rollers of the desired contour after the asphalt has been applied to the felt base, so that the resultant felt saturated surfacing is given the desired shape. It has also been proposed to fold the asphalt impregnated felt or paper into the desired shape, leaving the wide end thereof open, thereafter insert through the open end of the folded sheet a filler made up of comminuted inert material and a suitable binder, and then fold the open end to form the desired product.

According to the present invention, a plurality of sheets of varying width are made in the usual multi-cylinder paper making machine. These sheets may be made from any suitable material such as wool, cotton or linen rags, straw, hemp, flax or other vegetable fibers, which, when treated as is well known in the art, will product a sheet which can readily be saturated with asphalt or other waterproofing saturants to provide a suitable roofing or other surfacing base. Preferably, the sheets are simultaneously made from like material.

The cylinder molds are deckled, i. e. are provided with well known types of deckling devices so that the width of the sheet can be controlled at will. Two cylinder molds pref-

erably form sheets of the same width and the other cylinder molds form sheets of different widths. The sheet coming from the wet felt or carrying tapes of one cylinder mold is superposed over the sheet made and coming from the wet felt of an adjacent cylinder mold, and the superposed sheets are fed by the wet felt of the second cylinder mold in superposed position onto the sheet made by the third or next adjacent cylinder mold, etc. The sheets of different widths produced by the paper making machine are thus arranged in superposed relation, the carrying tapes or wet felts and the cylinder molds being preferably so arranged that the sheets are fed with the longitudinal center lines in alignment and coinciding when the sheets are superposed. The resultant product comprising a plurality of superposed sheets of different widths is then fed over a suction roll which functions to remove some of the excess moisture and thereafter through suitable pressing rolls and drying devices. There is thus produced a laminated fabric or sheet of maximum thickness along predetermined longitudinal portions and of gradually diminishing thickness transversely of the length of the sheet, this fabric is preferably severed along the longitudinal maximum thickened portions forming a sheet which has a gradual taper transversely of its length. The resultant sheets can be wound into rolls for subsequent treatment or may be fed directly to a roofing machine where they are saturated with bituminous material, such as asphalt, pitch or the like, and surfaced with granular or mineral matter such as slate, stone or mica. If desired, the strip of surfacing may be severed transversely to form tapered or thick butt shingles.

The present invention comprises a process of producing surfacing material which involves making a plurality of sheets of different widths and uniting the sheets to form a surfacing material, preferably of progressively decreasing thickness transversely of the length of the sheet, and also relates to the products produced by the practice of this process, i. e. the laminated strip of surfacing material having the laminæ of progressively

diminishing width and to the tapered shingle formed by cutting the laminated strip transversely of its length.

Other objects and advantages will appear from the following detailed description taken in connection with the accompanying drawings, in which—

Fig. 1 is a somewhat diagrammatic side elevation of a multi-cylinder paper making machine adapted to practice the present invention;

Fig. 2 is a section along the line 2—2 of Fig. 1 showing a section through the sheet formed in the machine in the stage of operation indicated by the line 2—2;

Figs. 3, 4, 5 and 6 are sections taken along the lines 3—3, 4—4, 5—5 and 6—6, respectively, corresponding to Fig. 2 and showing the position of the sheets at the stages of operation indicated by the lines 3—3, 4—4, 5—5 and 6—6, respectively; and

Fig. 7 is a section through a tapered shingle produced from the sheet of Fig. 6.

Referring to the drawings, 1 indicates the vats or containers of the usual type paper making machine, arranged to contain the digested material such as wool, cotton or linen rags, straw, hemp, flax or other vegetable fiber from which the sheets are made. Cylinder molds 2, 3, 4 and 5 are rotatably mounted in the vats 1 and are rotated by driving mechanism (not shown) to pick up and feed to carrying tapes or wet felts 6, 7, 8 and 9, respectively, the digested or comminuted material in the vats 1. The carrying tapes 6, 7, 8 and 9 are mounted to travel over the couch rolls 11, 12, 13 and 14, respectively, felt rolls 15 and jack rolls 16.

The herein described paper making machine differs from the customary multi-cylinder paper making machine in that each of the cylinder molds is equipped with a separate wet felt or carrying tape instead of having one wet felt common to all the cylinder molds. Each of the cylinder molds is equipped with a well known type of deckling device, so that the width of the sheet can be controlled at will. As the structure of the paper making machine, per se, forms no part of the present invention, and as such machines are well known in the art, they are merely indicated herein to the extent necessary to show the relation of the present invention thereto.

The sheets 19, 20, 21 and 22 are formed on cylinder molds 2, 3, 4 and 5 respectively and are removed by wet felts 6, 7, 8 and 9 and couch rolls 11, 12, 13 and 14 respectively. Any desired number of cylinder molds and cooperating wet felts may be used. As a preferred embodiment of the invention, there is shown a multi-cylinder paper making machine having four cylinder molds and four wet felts, the cylinder molds 2 and 5 being arranged to produce sheets 19 and 22 of the same width, as indicated in Fig. 5, and cylinder

molds 3 and 4 being arranged to produce sheets 20 and 21, respectively, of different widths, as shown in Fig. 4. The sheet 19 carried on wet felt 6 is fed in longitudinal alignment with the sheet 20 carried on wet felt 7 and the sheet 19 as shown in Figures 1 and 3 is fed by the wet felt 6 into superposed position over the sheet 20 on the wet felt 7, so that the longitudinal center lines of the two sheets 19 and 20 coincide. The wet felt 7 conveys the two sheets 19 and 20 into superposed position over the sheet 21 carried on wet felt 8 so that the longitudinal center lines of the 3 sheets coincide as shown in Figure 4. The wet felt 8 conveys the three sheets 19, 20 and 21 into superposed position on the sheet 22 carried on wet felt 9, so that the longitudinal center lines of the 4 sheets coincide as shown in Figure 5.

It will be noted that the sheets made by each cylindrical mold cooperating with the couch rolls and wet felts of each unit of the multi-cylinder paper making machine are fed in longitudinal alignment and when superposed one over the other are positioned so that the longitudinal center lines thereof coincide.

The resultant four-ply laminated sheet is fed by the wet felt 9 over the suction roll 25 which functions to remove some of the excess moisture from the laminated sheet. From the suction roll the four-ply laminated sheet is fed by the wet felt 9 between pressing rolls 26, 27. The pressing roll 26 is shaped to conform with the desired contour of the finished product. In the instant case the roll 26 is of circular cross section at the mid point of the longitudinal axis thereof and extends conically from the circular cross section portion to the ends, so that the laminated sheet passing through pressing rolls 26 and 27 is given the desired shape as shown in Fig. 6, i. e. the longitudinal center portion is of maximum thickness and the laminated sheet is of gradually diminishing thickness from this thickened portion transversely of the length of the sheet to the sides of the laminated sheet.

Preferably, the laminated sheet is passed from the pressing rolls 26, 27 over the drying rolls 28, 29, 30 and 31. From the drying rolls the sheet may be fed to a cutting machine where it is slit longitudinally along the thickened portion 32 and the resultant laminated sheets may be wound into rolls for subsequent treatment or may be fed directly to a roofing machine where they are saturated with asphalt, pitch or the like, surfaced with granular or mineral matter, and then severed transversely to form tapered or thick butt shingles of the shape shown in Fig. 7. If desired, the individual sheets may be saturated with asphalt or other waterproofing material and then united as described herein, so that the asphalt or other waterproofing material aids

in maintaining the bond between the individual sheets.

While there is shown and described herein as a preferred embodiment of the invention a process that produces a laminated strip having a longitudinal center portion of maximum thickness and of gradually diminishing thickness transversely of the length of the sheet from the maximum thickened portion, it will be understood that this invention is not limited thereto. For example, the paper making machine may be arranged to form a sheet having a plurality of longitudinal thickened portions and being of gradually diminishing thickness transversely of the length of the sheet extending from the thickened portions of the sheet by feeding sheets of different widths in suitable relation to produce such laminated sheet and passing such sheet through pressing rolls corresponding with the contour of the desired laminated sheet.

It will be noted that the finished tapered shingle formed by cutting the laminated sheet transversely of the length of the sheet has the top and bottom laminæ thereof of the same length and the intermediate laminæ of varying length.

While a preferred embodiment of the invention has been shown and described herein, it will be understood that various changes in the details thereof may be made without departing from the spirit of the invention, and therefore, this invention is not to be limited to the disclosure herein but only by the scope of the appended claims.

I claim:

1. In the process of producing waterproof weatherproof surfacing material suitable for roofing purposes the steps which comprise uniting a plurality of wet fibrous sheets of different widths, drying said sheets to form a substantially homogeneous strip, and waterproofing said strip.

2. The process of producing waterproof weatherproof surfacing material suitable for roofing purposes which comprises placing a plurality of wet fibrous sheets of different widths in superposed relation, uniting said sheets to form a felt base of varying thickness, removing excess moisture from said felt base and saturating said felt base with waterproofing material.

3. The process of producing waterproof weatherproof surfacing material suitable for roofing purposes which comprises simultaneously making a plurality of wet fibrous sheets of different widths, placing said sheets in longitudinal superposed relation, uniting said sheets to form a felt base of varying thickness, drying said felt base to form a substantially homogeneous felt and saturating said felt with bituminous material.

4. The process of producing waterproof weatherproof surfacing material suitable for

roofing purposes which comprises placing a plurality of wet fibrous sheets of different widths in superposed relation, uniting said sheets to form a felt base of varying thickness, drying said base to form a substantially homogeneous base, waterproofing the base, and severing the resultant base longitudinally to form a surfacing material of progressively decreasing thickness.

5. The process of producing waterproof weatherproof surfacing material suitable for roofing purposes which comprises simultaneously making four sheets, three of said sheets being of different widths, superposing said sheets so that the top and bottom sheets are of the same width and said sheets are in longitudinal alignment with the longitudinal center lines coinciding, uniting said sheets to form a surfacing material of varying thickness, and severing the resultant united sheet along the longitudinal center line to form a strip of surfacing material of progressively decreasing thickness transversely of the length of said united sheets.

6. In the process of producing tapered shingles, the steps which comprise placing a plurality of wet fibrous sheets of different widths in superposed relation, uniting and drying said sheets to form a substantially homogeneous strip having one surface thereof inclined with respect to the opposite surface transversely of its length, saturating with bituminous material and surfacing said strip.

7. The process of producing tapered shingles which comprises simultaneously making a plurality of wet fibrous sheets of different widths, superposing said sheets in longitudinal alignment, uniting and drying said sheets to form a substantially homogeneous strip having one surface thereof inclined with respect to the opposite surface transversely of its length, saturating said strip with bituminous material, surfacing said strip and severing said strip transversely of its length to form tapered shingles.

8. The process of producing tapered shingles which comprises simultaneously making four wet fibrous sheets, three of said sheets being of different widths, superposing said sheets in longitudinal alignment with the longitudinal center lines of said sheets coinciding and the top and bottom sheets being of the same width, uniting said sheets and removing the excess moisture therefrom, severing the resultant strip along the longitudinal center line, saturating and surfacing the severed resultant strips and cutting said resultant strips transversely to form tapered shingles.

9. A strip of substantially homogeneous surfacing material suitable for roofing purposes formed from a plurality of wet fibrous sheets of different widths and saturated with waterproofing material.

10. A strip of substantially homogeneous surfacing material suitable for roofing purposes formed from a plurality of wet fibrous sheets of different widths in superposed relation united by pressure and saturated with bituminous material.

11. A laminated strip of substantially homogeneous surfacing material suitable for roofing purposes, having laminæ in longitudinal alignment and of successively lesser widths and saturated with waterproofing material.

12. A four-ply laminated strip of surfacing material suitable for roofing purposes, three of the laminæ being in longitudinal alignment and of successively lesser widths, and the fourth lamina being substantially of the same width as the widest lamina and serving as one of the outer layers of the strip.

13. A tapered shingle strip of substantially homogeneous fibrous composition suitable for roofing purposes comprising a plurality of united wet fibrous sheets of different widths in superposed relation which has been dried and saturated with waterproofing material.

14. A tapered shingle strip of substantially fibrous composition suitable for roofing purposes comprising a plurality of sheets of successively lesser width and two sheets of substantially the same width, said two sheets serving as the outer surface layers of said strip, all of said sheets being united in superposed longitudinal relation.

15. A tapered shingle strip of substantially homogeneous fibrous composition comprising a plurality of sheets of successively lesser widths and two sheets of substantially the same width, said two sheets serving as the outer surface layers of said strip, all of said sheets being united in superposed longitudinal relation, said strip being saturated with bituminous material and surfaced.

16. A tapered laminated shingle having laminæ of different lengths united by pressure to form a homogeneous structure and saturated with bituminous material.

17. A tapered laminated shingle having laminæ of different lengths and two laminæ of substantially the same length, said two laminæ serving as the top and bottom surfaces of said shingle.

In witness whereof, I have hereunto set my hand.

HARRY A. EMERY.

CERTIFICATE OF CORRECTION.**Patent No. 1,852,006.****April 5, 1932.****HARRY ALLEN EMERY.**

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, line 28, claim 14, before the word "fibrous" insert the word homogeneous; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of July, A. D. 1932.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.