P. G. GARDNER.

MACHINE FOR PUNCHING ROOF MATERIAL.

APPLICATION FILED MAY 24, 1915.

1,191,297. Patented July 18, 1916.

FIG. 1.

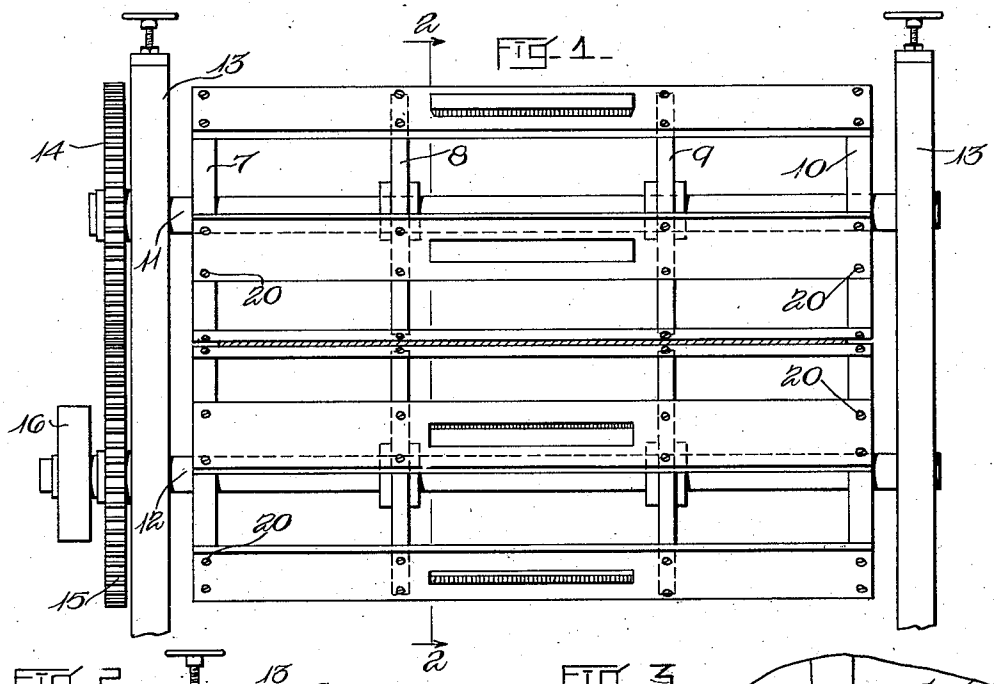


FIG. 2.

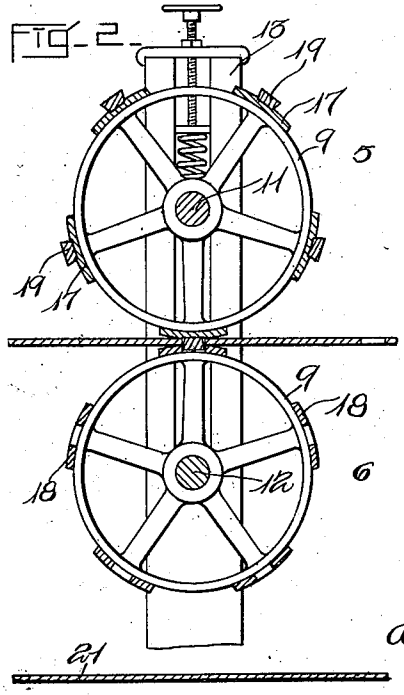


FIG. 3.

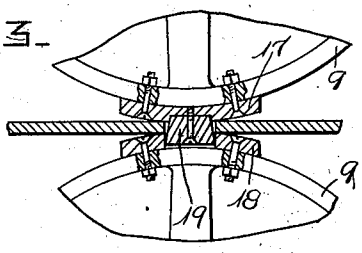
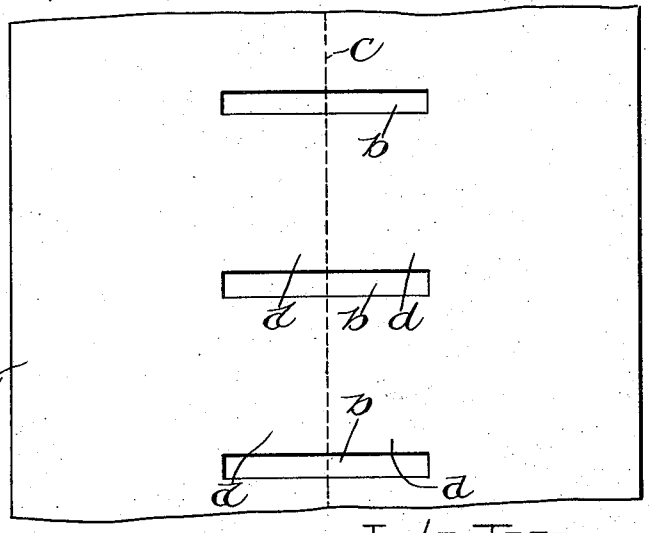


FIG. 4.



INVENTOR
P. G. GARDNER
by Albright Brown Dunby & Allen
ATTORNEYS

UNITED STATES PATENT OFFICE.

PERRY G. GARDNER, OF RUTHERFORD, NEW JERSEY, ASSIGNOR TO FLINTKOTE MANUFACTURING COMPANY, OF RUTHERFORD, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR PUNCHING ROOF MATERIAL.

1,191,297. Specification of Letters Patent. Patented July 18, 1916.

Application filed May 24, 1915. Serial No. 29,947.

To all whom it may concern:

Be it known that I, PERRY G. GARDNER, a citizen of the United States, and a resident of Rutherford, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Machines for Punching Roof Material, of which the following is a specification.

This invention has for its object to provide a machine which may be employed in the manufacture from flexible prepared roofing material, of what are sometimes called "shingle strips", that is, strips of weather-proof waterproof material having along one edge tabs or projections which, when the strips are laid, present the appearance of tabs or shingles.

On the accompanying drawing: Figure 1 represents a machine embodying the invention. Fig. 2 represents a vertical section on the line 2—2 of Fig. 1. Fig. 3 represents, on a larger scale, coacting punch and die portions of the rolls. Fig. 4 represents a portion of the punched material.

The material which is to be passed through my improved machine, usually consists of a sheet of felt or equivalent fibrous material impregnated with a suitable relatively heavy hydrocarbon waterproofing substance such as low-melting-point asphalt, pitch, or the like, and coated with a relatively high-melting-point weather-proof material such as pitch or asphalt with or without pigments incorporated therein. Sometimes such roofing material is provided with an outer coating or layer of crushed mineral.

On the drawing, *a* indicates a portion of such a sheet, in which it is desired to form the transverse parallel slots *b*, so that when the sheet is subsequently longitudinally cut or slit along the dotted line *c*, there will be formed two similar shingle strips each having along one edge the tabs or projections *d*, *d*, which, when the strips are laid in overlapping relation on the roof, are exposed and present the appearance of shingles or tiles. The method of making such shingle strips is described in Letters Patent to F. C. Overbury, No. 908,125, dated December 29, 1908.

The roofing material, because of its nature, is somewhat difficult to handle and operate upon, and when cut or punched to form the transverse slots, the cuttings and punchings are apt to accumulate and clog the machine. The present invention is shown as embodied in a machine by which the punching may be performed continuously and expeditiously, and in which there is no danger of clogging because of the formation of the cuttings or punchings formed by the punching operation.

I employ two skeleton rolls indicated as a whole at 5 and 6 respectively, the former being provided with a circular series of punches and the latter with a circular series of coöperative dies. Each roll comprises a plurality of wheels 7, 8, 9 and 10, consisting of a circular rim, a hub, and suitably formed spokes. The hubs of the two rolls are rigidly fastened to, or they are formed on shafts 11 and 12 which are journaled in suitable boxes in a frame 13 of any convenient construction, the boxes being so mounted that one of the rolls may yield slightly away from the other. The shafts are provided with intermeshing gears 14, 15, the teeth of which are long enough to permit the relative yielding movement of the rolls without being unmeshed. A pulley 16 may be secured to one of the shafts to impart power thereto.

The roll 5 is provided with a series of spaced or separated longitudinal bars 17 which are segmental in cross section so that their outer surfaces are concentric with the axis of the shaft 11; and the roll 6 has similar longitudinal bars 18. Preferably these bars are located in the radial lines of the spokes of the rolls to increase the rigidity of construction. The segmental bars form the interrupted or longitudinally slotted periphery of the rolls, and they are longer than the width of the roofing sheet to be punched.

The bars 17 of the roll 5 are formed or provided with punches 19 suitably shaped to form the slots *b* in the roofing sheet, and the bars 18 of roll 6 are provided with complemental through apertures to constitute dies or die blocks for coöperation with the punches. Hence when the sheet of roofing is fed between the rolls, the punches and dies coöperate in punching out small pieces of the material and thus forming the slots *b*. I have not shown any supplemental means for feeding the roofing sheet, but it will be

understood that the machine which I have described may, if desired, be located between the pressure or cooling rolls of the roofing machine, and the reel or reels on which the punched and longitudinally split sheet is wound, the peripheral speed of the rolls 5 and 6 being correlated to the speed of the traveling sheet. The segmental bars 17 and 18, however, assist by their gripping action upon the sheet, in feeding it and thus preventing a ragged cut.

By forming the lower roll with the widely separated peripheral bars 18 ample space is left between them for the discharge of the cuttings or punchings as the roll rotates, for if they fall or temporarily lodge on the inner faces of the said bars, they are dislodged therefrom and fall through the open spaces as the roll rotates. While I prefer the described construction for both rolls, it is not necessary that the upper roll should have a broken or interrupted periphery, as the cuttings do not reach the interior thereof. The construction which I have described possesses other advantages, since the bars may be removed independently of each other from the rolls for purposes of repair or replacement, by removing the screws, bolts or other fastenings 20 by which they are secured to the rims. The rolls have the inner wheels 9 and 10 located beyond the ends of but closely adjacent the punches and dies so as to hold them rigidly against yielding under pressure relatively to the shafts.

If desired I may employ a traveling belt 21, of which a portion is indicated in Fig. 2, for receiving and removing the punchings or cuttings which are discharged from the lower or female roll.

Having thus explained the nature of the invention and a machine in which the same may be embodied, without attempting to set forth all the forms in which it may be embodied, or all the modes of its use, what I claim is:

1. A machine for forming transverse slots in a sheet of prepared roofing material comprising coacting rotary rolls, of which one is provided with a circular series of punches, and the other of which is provided with a series of open dies adapted to permit the passage of punchings therethrough, the last mentioned roll consisting of a series of spaced peripheral longitudinally extending bars, widely separated to permit the discharge from the interior thereof of the punchings formed from the sheet of roofing material.

2. A machine for forming transverse slots in a sheet of prepared roofing material comprising coacting rotary rolls not less in length than the width of the said sheet, said rolls being each formed with widely spaced peripheral longitudinally extendings bars, the bars of one roll being provided with punches, and the bars of the other roll being formed with open dies arranged to permit passage of the punchings therethrough, substantially as set forth.

3. In a machine of the character described, the combination with a punch roll having a circular series of punches projecting from its periphery, of a die roll having an interrupted or slotted periphery formed by segmental parallel bars, said bars being apertured to constitute dies for coöperation with the said punches, the said bars being spaced apart to permit the discharge therebetween of the cuttings or punchings, said die roll having wheels or supporting members spaced beyond the ends of the die apertures so as not to interfere with the passage of punchings through said apertures.

In testimony whereof I have affixed my signature.

PERRY G. GARDNER.