A. S. SPIEGEL.

ROOFING MACHINE.

APPLICATION FILED MAR. 8, 1916.

1,192,132.

Patented July 25, 1916.

3 SHEETS—SHEET 1.

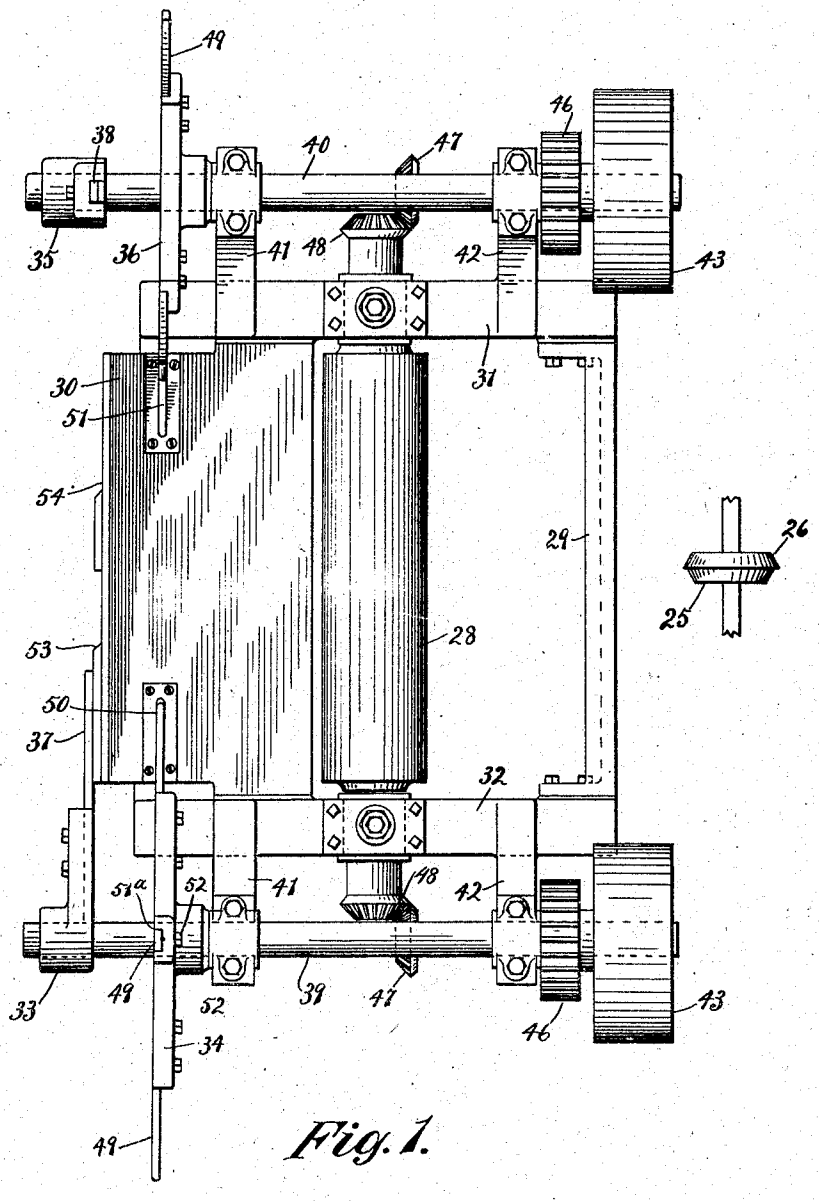


Fig. 1.

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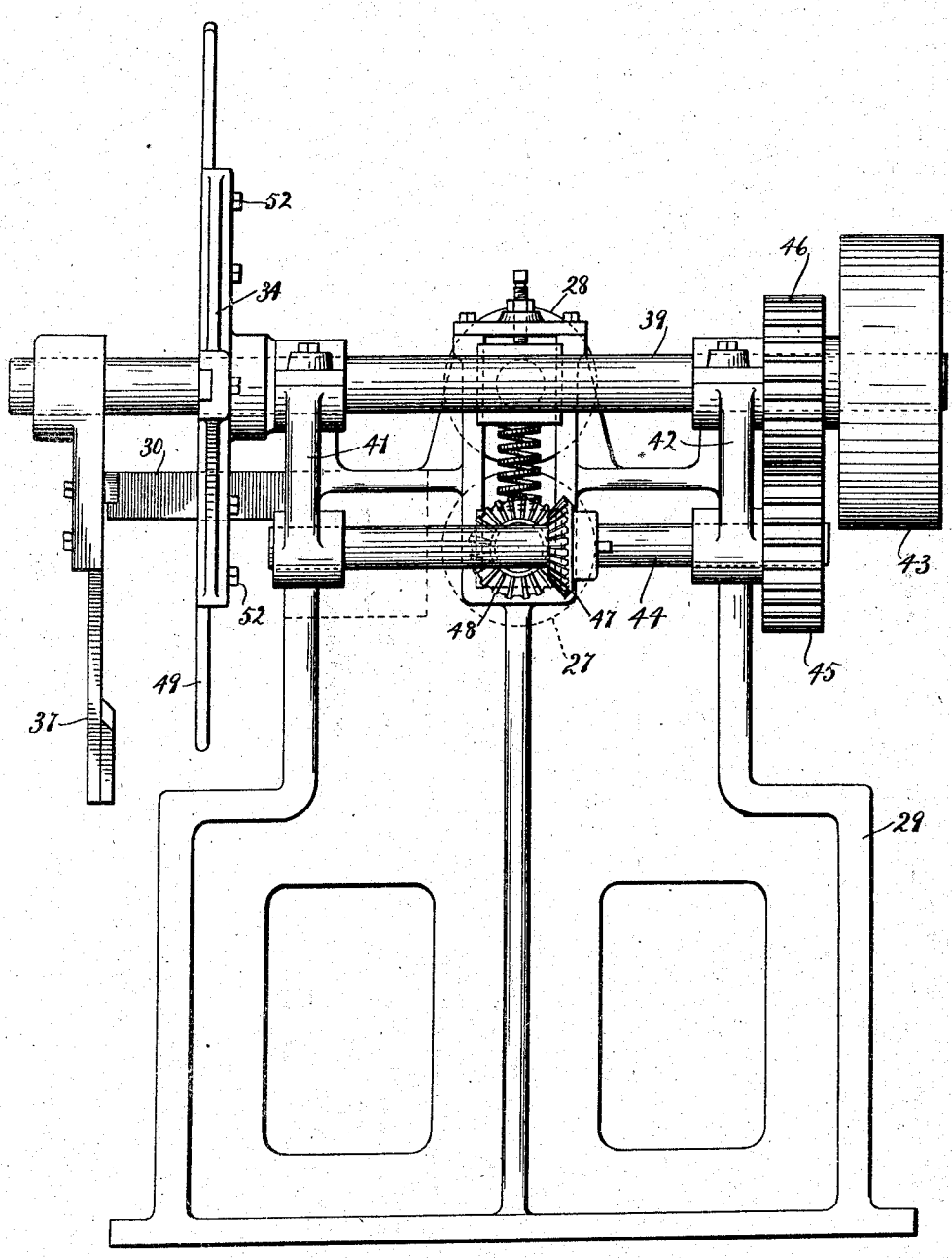


Fig. 2.

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3 SHEETS—SHEET 3.

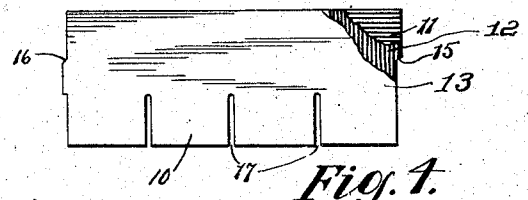


Fig. 4.

Fig. 3.

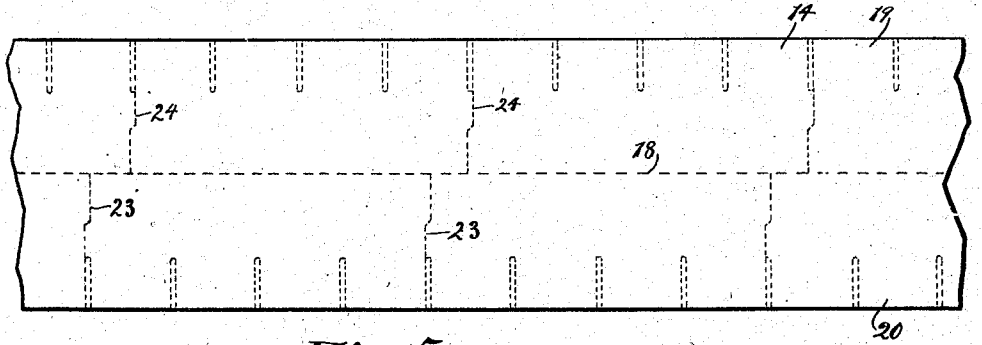


Fig. 5.

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UNITED STATES PATENT OFFICE.

ALEXANDER S. SPIEGEL, OF CHICAGO, ILLINOIS.

ROOFING-MACHINE.

1,192,132. Specification of Letters Patent. Patented July 25, 1916.

Application filed March 8, 1916. Serial No. 82,826.

To all whom it may concern:

Be it known that I, ALEXANDER S. SPIEGEL, a citizen of the United States, and resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Roofing-Machines, of which the following is a specification and which are illustrated in the accompanying drawings, forming a part thereof.

The invention relates to the manufacture of prepared roofing and more particularly to the production of so-called strip shingles. These shingles comprise sections of prepared roofing adapted to be laid upon the roof end to end in overlapping rows and each section has its weather edge notched at intervals to simulate the appearance of a plurality of individual shingles.

The invention contemplates a machine which is adapted to be continuously and progressively operative upon a length of prepared roofing for dividing it into the said strip shingles.

The object of the invention is to provide improved means for effecting a rapid production of the strip shingles without waste of material, the features of improvement having more especial reference to the rapid operation of the machine itself, and to a construction which may be operative upon the prepared roofing immediately after its production and while its adhesive layer is still soft.

In the accompanying drawings, Figure 1 is a plan view showing a form of the improved machine which is constructed for simultaneous operation upon both parts or halves of a centrally divided continuous web of prepared roofing, the slitting rolls for dividing the web being conventionally represented, Fig. 2 is a side view of the roofing machine illustrated in Fig. 1, Fig. 3 is a front elevation of the machine illustrated in Figs. 1 and 2, the web of prepared roofing being shown in transverse section, Fig. 4 is a plan view showing a form of strip shingle adapted to be produced by the machine illustrated in Figs. 1, 2 and 3, and Fig. 5 is a plan view showing a continuous web of prepared roofing with the manner in which the same is to be cut for producing strip shingles of the form illustrated in Fig. 4, indicated thereon by dotted lines.

The strip shingle, as 10 (Fig. 4) may be formed to embody the combined interlocking and self spacing feature forming the subject of my application for patent on prepared roofing Serial No. 61,538, filed November 15, 1915. It is cut from a web, as 14 (Fig. 5) of prepared roofing and preferably comprises the usual foundation or body layer 11, of saturated felt, an adhesive coating 12, of asphalt or similar material, and a surface layer 13 of grit or the like. When made in the form shown, the strips 10 have complementary shoulders 15, 16, at their opposite ends and a series of notches 17 extending along one edge. Usually the web 14 will be twice the width of the individual strips 10. When so formed it will be centrally divided as indicated by the dotted line 18 on Fig. 5, and each of the parts or halves 19, 20, of the web 14 will also be cut through at intervals, as upon the broken lines 23 and 24. The central division of the web 14 along the line 18 may be accomplished in a well known manner, as by slitting rolls which are conventionally represented at 25 and 26, Fig. 1. The two parts or halves 19, 20, of the web are then received between a pair of horizontal feed rolls 27 and 28. These feed rolls are mounted, one above the other, in a frame generally designated 29. They serve for effecting a continuous movement of the divided web over a horizontal die table 30. This die table is rigidly fixed in position, as by being extended between the two upright side members 31 and 32 of the frame 29.

When the two parts or halves 19, 20, of the web 14 are to be simultaneously received between the feed rolls, 27 and 28, as shown, a pair of rotating cutter heads 33, 34 and 35, 36, coöperate with the die table from each side. These two sets of cutter heads are of like construction, except that when the strips 10 have the complementary shoulders 15, 16 at their opposite ends, the blades, as 37 and 38, of the cutter heads 33 and 35, respectively, will be differently formed. Preferably the two cutter heads, 33, 34 and 35, 36, of each pair are mounted upon a common shaft, as 39 or 40. Each of these shafts extends along the corresponding side of the machine and is parallel with the direction of the travel of the web 14, between the feed rolls 27, 28. As shown, each of the shafts 39, 40, is journaled in brackets 41, 42, of the corresponding side member 31, 32 of the frame 29. Each shaft 39, 40, may be provided with a belt pulley 43 at that end which is remote from the corresponding set

of cutter heads, 33, 34, or 35, 36. When so constructed either one of the belt pulleys 43 may be used for driving the machine.

The lower feed roll 27 is driven from one of the shafts 39, 40. In the arrangement shown this feed roll also serves for transmitting motion from the shaft 39 or 40, having the belt pulley 43 which is being used for driving the machine, to the other one of said shafts. To this end, a counter shaft 44 extends parallel with and below each of the shafts 39 and 40 on a level with the feed roll 27. Each of these counter shafts is journaled in the corresponding set of brackets 41, 42 and it is operatively connected with the adjacent shaft 39 or 40 by intermeshing spur gears 45 and 46. Each counter shaft 44 is also operatively connected with the feed roll 27, as by a pair of intermeshing beveled gears 47 and 48, one mounted on the corresponding counter shaft 44 and the other mounted on the adjacent end of the feed roll. As shown, each of the cutter heads 34 and 36 is provided with four blades 49 which serve for the purpose of forming the notches 17 in the strip shingle 10. Each of these blades is mounted in the corresponding cutter head 34, 36, as to project radially from the corresponding shaft 39, 40, in a common plane and they are located at equal intervals about the shaft. During the rotation of the shafts 39 and 40, the corresponding blades 49 successively pass through a slotted opening 50 or 51 in the die table 30 and coöperate with the margins of the opening for notching the web. In order that this notching may be effected by a shearing cut, the hafts 39 and 40 are preferably located above the level of the die table 30. This arrangement provides that the outer end of each blade 49 will be first engaged with the web while the cutting action proceeds inwardly along the blade and toward the adjacent edge of the web. In order that the depth of the notches 17 may be varied, the effective length of the blades 49 is preferably adjustable. As shown, the inner end of each blade 49 enters a socket 51ª in the corresponding head 34, 36, and is adjustably secured therein by a set screw 52. The blades 37 and 38 of the cutter heads 33 and 35 serve for dividing the corresponding part or half 19, 20, of the web 14, upon the broken lines 23 or 24. The different form of the two blades 37 and 38 arises from the desirability of making all of the strip shingles 10 of the same shape, whethe produced from one or the other of the two parts or halves 19, 20 of the web 14. These blades also project radially from the corresponding cutter heads 33 and 35. They coöperate with the adjacent parts 53, 54 of the forward edge of the die table 30. The two parts 53, 54 of the forward edge of the die table 30 are each accordingly made of a complementary shape with the blade 37 or 38 of the adjacent cutter head 33, 35. The location of the shafts 39 and 40 above the level of the die table 30, already described, provides that a shearing cut is also effected by each of the blades 37 and 38, the cut, in each instance, beginning at the outer end of the plate and proceeding inwardly along the blade and toward the adjacent edge of the web 14. Preferably the relative radial positions of the several blades 49 and the two blades 37, 38, is such that the blades 49, at the two sides of the machine operate alternately, and the blades 37 and 38 do not operate together or at the same time with the blade 49 at the same side of the machine.

As all of the parts of the machine rotate continuously they may be operated at high speed. Furthermore, neither the width of the strips 10, nor the position of the shoulders 15, 16 with reference to the side of the strips, are dependent upon a uniform movement of the web 14 between the feed rolls 27, 28. It has also been found that a softness of the adhesive layer 12 does not interfere with the operation of the cutter blades 49 and 37, 38, as is the case when reciprocating cutter blades are employed. The invention accordingly renders it entirely practicable to form the web 14 into the strip shingles 10 immediately after it has been produced and while the adhesive layer 12 is still soft.

I claim as my invention,—

1. In a roofing machine, a die table having a lateral notch at its edge and a cutting edge at one end, a transverse shaft arranged above the level of the table carrying cutting blades adapted for coöperation with the said lateral notch, and a cutting blade mounted on the end of the shaft adapted for coöperation with the end of the table.

2. In a roofing machine, in combination, a die table having a lateral notch at one side and a cutting edge at one end parallel with said notch, a horizontal shaft located above the level of the table and beyond but parallel with the said side of the table, a series of radial blades carried by the shaft and equally spaced about its axis in a common plane for successive downward movement through the lateral notch of the die table during the rotation of the shaft, a single blade carried by the shaft and projecting radially therefrom for coöperation with the said transverse cutting edge of the table by downward movement by said edge during the said rotation of the shaft and means for moving a web over the die table in a direction parallel with the said shaft.

3. In a roofing machine, in combination, a die table having a lateral notch at one side, and a cutting blade substantially fitting the said notch mounted for downward movement through the notch about an axis which is above the level of the table and beyond but

parallel with the said side of the table, the blade being radial to the said axis.

4. In a roofing machine, in combination, a die table having a lateral notch at each side and a cutting edge at one end parallel with said notch, a pair of horizontal shafts located above the level of the table, one of said shafts being beyond but parallel with each side of the table, a series of radial blades carried by each shaft and equally spaced about the axis of the shaft in a common plane for successive downward movement through the lateral notch at the adjacent side of the table during the rotation of the shaft, each blade being constructed to substantially fill the corresponding notch during its movement through the same, a single blade carried by each shaft and projecting radially therefrom for coöperating with an adjacent part of the said transverse cutting edge at the end of the table, means for moving a web over the die table in a direction parallel with the said shafts, and a pair of slitting rolls operating centrally between the shafts.

5. In a roofing machine, in combination, a die table having a lateral notch at each side and a cutting edge at one end parallel with said notch, parts of the said cutting edge at each side of the longitudinal median line of the table each comprising a pair of relatively offset portions and an intermediate connecting shoulder, a pair of horizontal shafts located above the level of the table, one of said shafts being beyond but parallel with each side of the table, a series of radial blades carried by each shaft and equally spaced about the axis of the shaft in a common plane for successive downward movement through the lateral notch at the adjacent side of the table during the rotation of the shaft, each blade being constructed to substantially fill the corresponding notch during its movement through the same, a single blade carried by each shaft and projecting radially therefrom for coöperating with the adjacent part of the said cutting edge at the end of the table, each of the last mentioned blades conforming in shape to the part of the said cutting edge which is at the same side of the longitudinal median line of the table, means for moving a web longitudinally over the die table and a pair of slitting rolls operating in the plane of the said longitudinal median line of the table.

ALEXANDER S. SPIEGEL.