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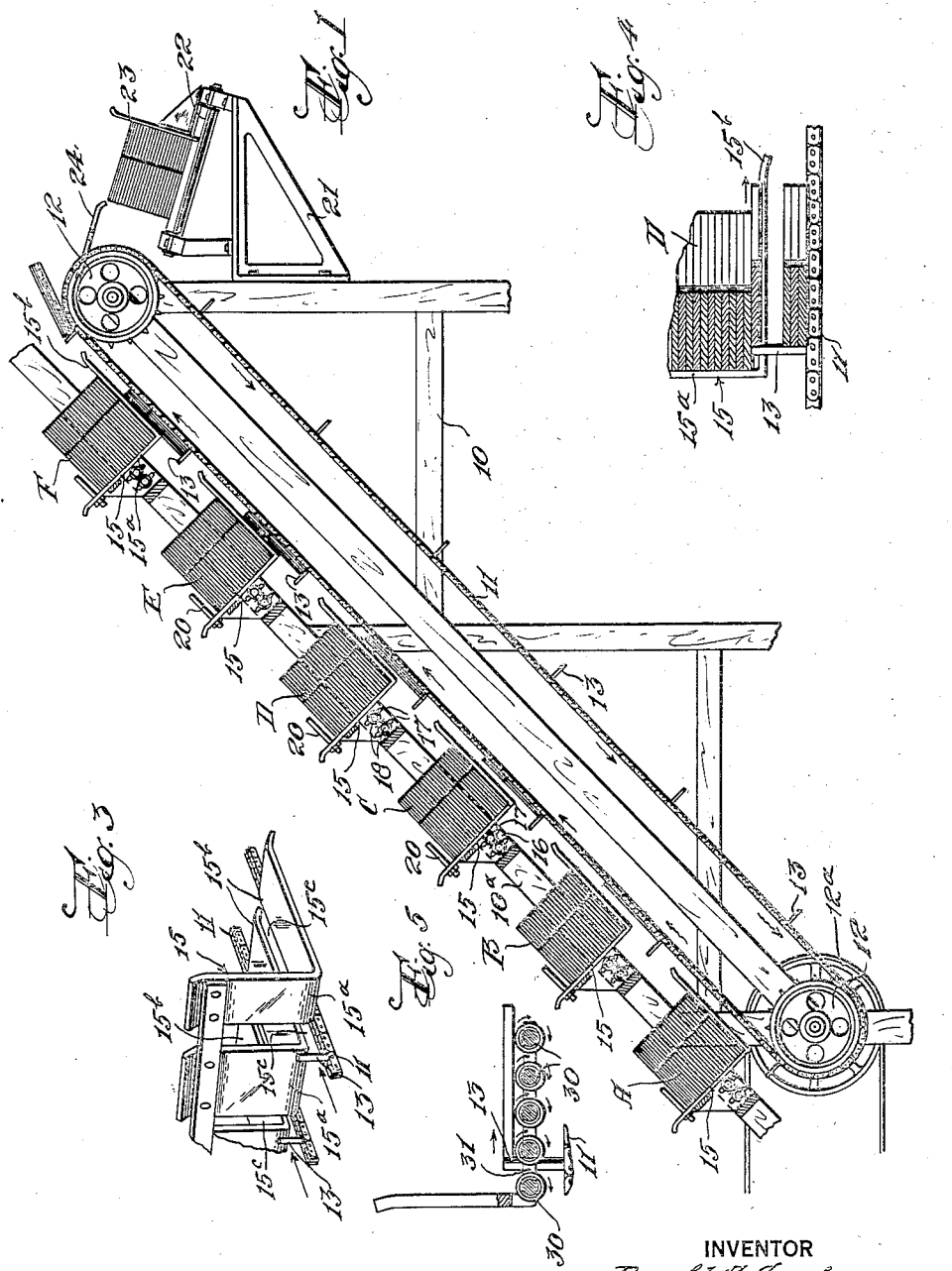
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APPARATUS FOR ASSEMBLING ROOFING ELEMENTS

Filed May 4, 1929

2 Sheets-Sheet 1



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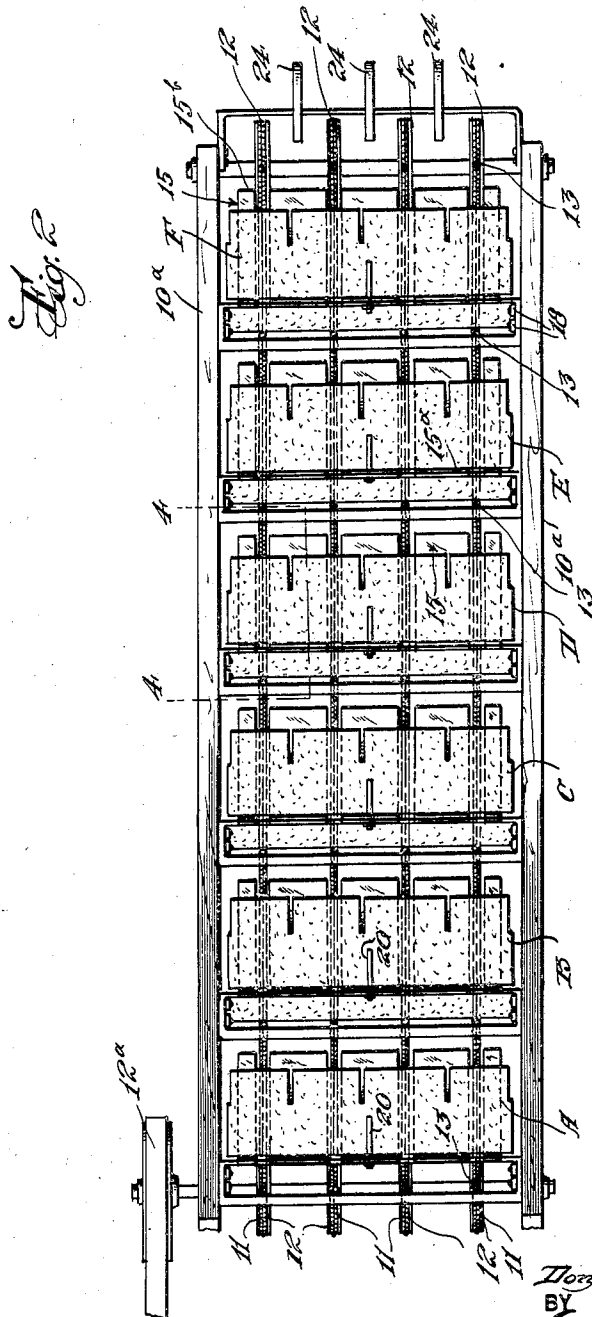
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Filed May 4, 1929

2 Sheets-Sheet 2



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APPARATUS FOR ASSEMBLING ROOFING ELEMENTS

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This invention relates to apparatus for assembling elements of substantially uniform thickness from separate stacks or piles thereof, and finds one particular adaptation in the roofing industry for assembling shingle elements of different colors or designs into piles or bundles composed of a number of shingles of each of the several colors or designs.

A very considerable proportion of prepared roofing shingles manufactured at the present time are surfaced with mineral grit or the like, in various so-called multi-color effects. In the more desirable types of prepared roofing of this character, the aim is to produce a roof in which shingle portions of various colors are distributed haphazardly on the roof in such a way as to avoid the possibility of any definite mathematical patterns or repetition of color effects. This is generally achieved in practise by manufacturing the shingles or shingle strips in separate runs, the color arrangement of the shingles or strips of one run differing more or less from those of the other runs, and subsequently assembling the shingles from the separate runs, preferably according to some preconceived plan, into packages in which there will be a number of shingles from each run. In practise also, the arrangement or sequence of the shingles in some of the bundles differs from that in the others, so that when the shingles are taken successively from a number of such bundles and applied on the roof, the desired ornamental appearance will be secured. Hitherto it has been the practise to store a considerable quantity of shingles from each of a number of runs and then by manual labor, assemble the shingles from the several runs into bundles containing shingles from the several runs arranged therein as described. Somewhat the same general procedure is practised in conjunction with shingle strips differing from one another in tab-configuration, produced in separate runs but used in combination with one another as a set in laying the roof.

It is an object of my invention to provide mechanism whereby shingles or shingle strips differing from one another in the color arrangement thereon, or in the tab design there-

of, may be assembled into bundles containing the various shingles or shingle strips in definite sequence, the mechanism being also operable to vary the sequence in different bundles.

In accordance with the invention, I provide adjustable shelves or brackets each of which is adapted to hold a pile or stack of shingles or shingle strips from one of several runs in proper relation to means cooperating with the several stacks of shingles for successively withdrawing therefrom one of the shingles in each stack until the whole number of stacks have been thus operated upon to collect or assemble a set or series of shingles or shingle strips composed of one shingle or shingle strip from each stack. Provision is also made for continuing or repeating the aforesaid assemblage until a bundle of the desired number of shingle elements is formed. According to the preferred form of the invention, each of the stacks of shingles which are to make up the set or series in the bundle is supported in such a way that the lowermost shingle in the stack may be readily withdrawn therefrom, and the arrangement of the whole is such that the withdrawal means operates upon the several stacks to withdraw the lowermost shingles thereof in succession and deposit them in a suitable receptacle or onto a collecting device.

The invention will be more clearly understood from the more detailed description which follows, and from the accompanying drawings in which,

Figure 1 is a side elevation of the preferred embodiment of the invention,

Figure 2 is a plan view thereof,

Figure 3 is a detail in perspective of part of the mechanism,

Figure 4 is a detail in section showing the action of the withdrawal means upon a stack of shingles, and

Figure 5 is a fragmentary view, partially in section, showing a modified construction of the supporting means for the stacks of shingles.

Referring more in detail to the drawings, the numeral 10 indicates a suitable framework for the mechanism and the numeral 11

denotes a series of spaced endless chains passing around the sprockets 12, suitably journaled in the framework and driven from any convenient source of power, as by means of a pulley 12a. In the preferred construction illustrated, the sprockets at one end of the path are mounted at a higher elevation than those at the opposite end so that the chains will travel in a path at an inclination, which I prefer shall be at least 45°, to the horizontal. The chains 11 have fixed thereto a number of spaced fingers or pins 13, the fingers on the several chains being in transverse alignment and functioning as the withdrawal means for the shingles from the several stacks in a manner as presently will appear.

In order to support a number of stacks of shingles or similar elements in operative relation to the mechanism thus far described, I provide a series of spaced supporting members comprising brackets or shelves 15 secured to one of the members 10a of the supporting structure 10 and constructed of angular sections each having an upright 15a and a bed-plate 15b extending substantially at right angles therefrom, the several sections of each bracket being spaced from each other as at 15c and the several shelves being spaced from each other. If desired, the uprights 15a of each bracket may be in one piece, with the portion 15b formed as a recessed plate. Each bracket 15 of the series is arranged for adjustment relative to the chains 11, as for example, by means of extensions 16 secured rearwardly of the uprights 15a, and slotted as at 17 to accommodate securing bolts 18 passing therethrough and through the supporting member 10a. The spaces 15c intervening between the sections of each supporting member 15 are in the same general plane with the chains 11 so as to accommodate the pins or fingers 13 for free passage therethrough. In practise, the supports 15 will be adjusted to a position in which the bed-plates 15b thereof are spaced from the chains 11 a distance slightly in excess of the aggregate thickness of the total number of shingles or other elements to be collected in one pass of the chains beneath the brackets, and the pins or fingers 13 will be of a height sufficient to extend substantially to the upper face of the lowermost element in each stack, but insufficient to extend therebeyond. As will be noted from Figure 1, the stacks of elements are arranged on the supporting shelves with the plane of the elements in parallelism to the plane of travel of the chains and with the edges of the elements extending in planes generally at right angles to the plane of travel of the chains. Hence, the shingles in each stack will lie in planes at an angle somewhat greater than 45° to the horizontal so that the weight of the stack will bear largely upon the portions 15a of the supporting shelves rather than upon the bed-plates 15c, thus offering comparatively little

resistance to the progressive removal of the lowermost shingle in each stack by the pins 13.

In order to preclude the possibility of the shingles in the stacks tilting or falling backwardly, when arranged in the position illustrated, stop plates 20 may be adjustably secured to the supports 15.

Mounted adjacent the discharge or delivery end of the conveyors or chains 11, upon suitable brackets 21 is a series of idle rolls 22 and a stop plate 23 to serve as a collecting device for accumulating a bundle composed of the desired number of shingles collected from the several stacks.

In operation, and assuming that it is desired to assemble into bundles shingles or shingle strips from six separate runs, the shingles from the several runs designated as A, B, C, D, E, F, and illustrated by square-butt strip shingles, may be stacked upon the several shelves in the order named. It will be understood, of course, that the shingles of each of said runs differ in color, or tab-design, or both, from those of the other runs. During the forward movement of the chains, the transversely aligned fingers 13 carried thereby will grasp the bottom-most shingle in each stack along its rearward edge as clearly shown in Figure 4, and force the same from beneath the remainder of the shingles in the stack, whereupon the shingle will drop onto the chain and move forwardly until the fingers 13 come into contact with the lowermost shingle of the succeeding stack and withdraw the same therefrom. Each set of fingers 13 thus withdraws the bottom-most shingle of the several stacks in succession so that by the time the shingle first withdrawn passes beyond the last stack in the series it will have superposed thereon, in definite order, one shingle from each of the other stacks. As the complete set reaches the discharge end of the chains, the several shingles thereof will pass over the inclined plate 24 and into the collecting device 23. The operation continues as described, the succeeding series of pins 13 withdrawing the then bottom-most shingle of the several stacks and when a sufficient number of such sets of shingles are accumulated to form a bundle, they may be removed from the collector 23 as by sliding the bundle laterally over the idle rollers 22, and the bundle may then be bound or wrapped in any suitable fashion.

As will be apparent from the above, the bundles thus collected will contain a plurality of sets of shingles from the several stacks arranged in the bundles in recurring series. In order, however, to avoid objectionable patterning of the shingle colors or designs on the roof, it is desirable that the shingles in some of the bundles be arranged therein in a different sequence than in some of the other bundles. The sequence in which

the shingles from the separate runs lie in the bundles may be varied as desired, merely by changing from time to time, the position of the shingles from the several runs on the supporting shelves 15. Thus, after a sufficient number of bundles have been accumulated in which the sequence of the shingles therein is A, B, C, D, E, F, the stacks of shingles from said runs may be arranged on the supporting shelves in the order A, C, B, F, E, D; so that the bundles assembled during the operation of the machine as described, will have the shingles arranged therein in the last-named order. This variation of the sequence of the shingles in the completed bundles may obviously be carried to as many permutations as the number of different shingles will permit. While I have illustrated the operation of the machine in conjunction with six stacks of shingles, it is obvious that a greater or lesser number may be used. Where the number of shelves are in excess of the number of different types of shingles to be assembled, such shelves as may be unnecessary, may be simply left idle without altering the operation of the machine.

In Figure 5, I have shown a modified construction of the supporting shelves 15, wherein instead of the flat bed-plates 15c, I use a series of sectional idle rolls 30 journaled in the side members 31 spaced from each other to accommodate the pins or fingers 13. By means of these idle rolls, the withdrawal of the bottom-most shingle or other element of each stack may be facilitated.

Although I prefer a construction such as illustrated, wherein the stacks of shingles are supported at an angle to the horizontal, it would be quite feasible to mount the chains for travel in a horizontal path, and employ the withdrawing mechanism described in conjunction with stacks positioned so that the shingles therein also lie in horizontal planes. With such construction, a suitable vertically disposed retaining plate would be formed with the supports adjacent the forward ends thereof, with its lower extremity spaced from the bed-plates 15c, a distance corresponding substantially to the thickness of a single element or roofing strip, whereby the lowermost shingle of each stack may be ejected therefrom without ejecting others in the stack.

Having thus described my invention, it will be understood that numerous changes and modifications may be made therein without departing from the spirit of the invention as defined in the subjoined claims.

I claim as my invention:

1. In apparatus of the character described, means for supporting roofing elements in a plurality of spaced stacks, means cooperating with said supporting means for successively withdrawing the lowermost element of each of said stacks, whereby to form a set of elements composed of one element from

each of said stacks, and means for accumulating a plurality of said sets of elements into a bundle.

2. In apparatus of the character described, means for supporting roofing elements in a plurality of spaced stacks with the elements thereof lying in planes greater than 45° to the horizontal, and means for sequentially removing the bottommost elements from said stacks.

3. In apparatus of the character described, means for supporting roofing elements in a plurality of spaced stacks with the elements thereof lying in planes greater than 45° to the horizontal, and means for sequentially removing the elements from said stacks, said last named means comprising mechanism for engaging said elements along an edge thereof and moving the same forwardly in a plane parallel to the plane of the elements.

4. Apparatus of the character described, comprising a series of spaced supports each adapted to hold a stack of roofing elements in face to face contact, means for sequentially contacting the bottom-most element on said supports along an edge of said elements to move the same forwardly and away from the supports, and means for gathering the elements thus removed from the supports into a bundle composed of a plurality of elements from each of said stacks.

5. In apparatus of the character described, a plurality of spaced supports each adapted to hold a plurality of roofing elements in face to face contact, and means for simultaneously removing an element from each of said supports, said last-named means coacting sequentially with said supports to remove the elements therefrom and means for collecting the elements thus removed into bundles composed of a plurality of elements from each of said stacks.

6. In apparatus of the character described, means for supporting roofing elements in a plurality of spaced stacks, means for successively removing one of the elements from each of said stacks and accumulating the elements thus removed in piles each composed of a collection of elements removed from said stacks and means for accumulating a number of said piles into a bundle of roofing elements composed of a plurality of elements from each of said stacks.

7. In apparatus of the character described, means for supporting roofing elements in a plurality of spaced stacks, means for successively removing one of the elements from each of said stacks in sequence and accumulating the elements thus removed from said stacks in a continually advancing series of piles each composed of a collection of elements removed from said stacks and means for accumulating a number of said advancing series of piles into a bundle of roofing elements.

8. In apparatus of the character described, means for supporting roofing elements in a plurality of spaced stacks, means for successively removing one of the elements from
5 each of said stacks in sequence and accumulating the elements thus removed from said stacks in a continually advancing series of piles each composed of a collection of elements removed from said stacks and means
10 for assembling a plurality of said piles into bundles containing a number of elements from each of said stacks.

9. In apparatus of the character described, means for supporting roofing elements in a
15 plurality of spaced stacks with the elements thereof lying in planes greater than forty-five degrees to the horizontal, means for sequentially removing the bottom-most element from said stacks, means for accumulating
20 sets of elements composed of one element from each of said stacks and means for collecting said sets into bundles composed of a plurality of elements from each of said stacks.

Signed at Rutherford, in the county of
25 Bergen and State of New Jersey, this 2nd day of May, A. D. 1929.

DONALD A. CUMFER.

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