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E. T. STREET

SHINGLE STACKER

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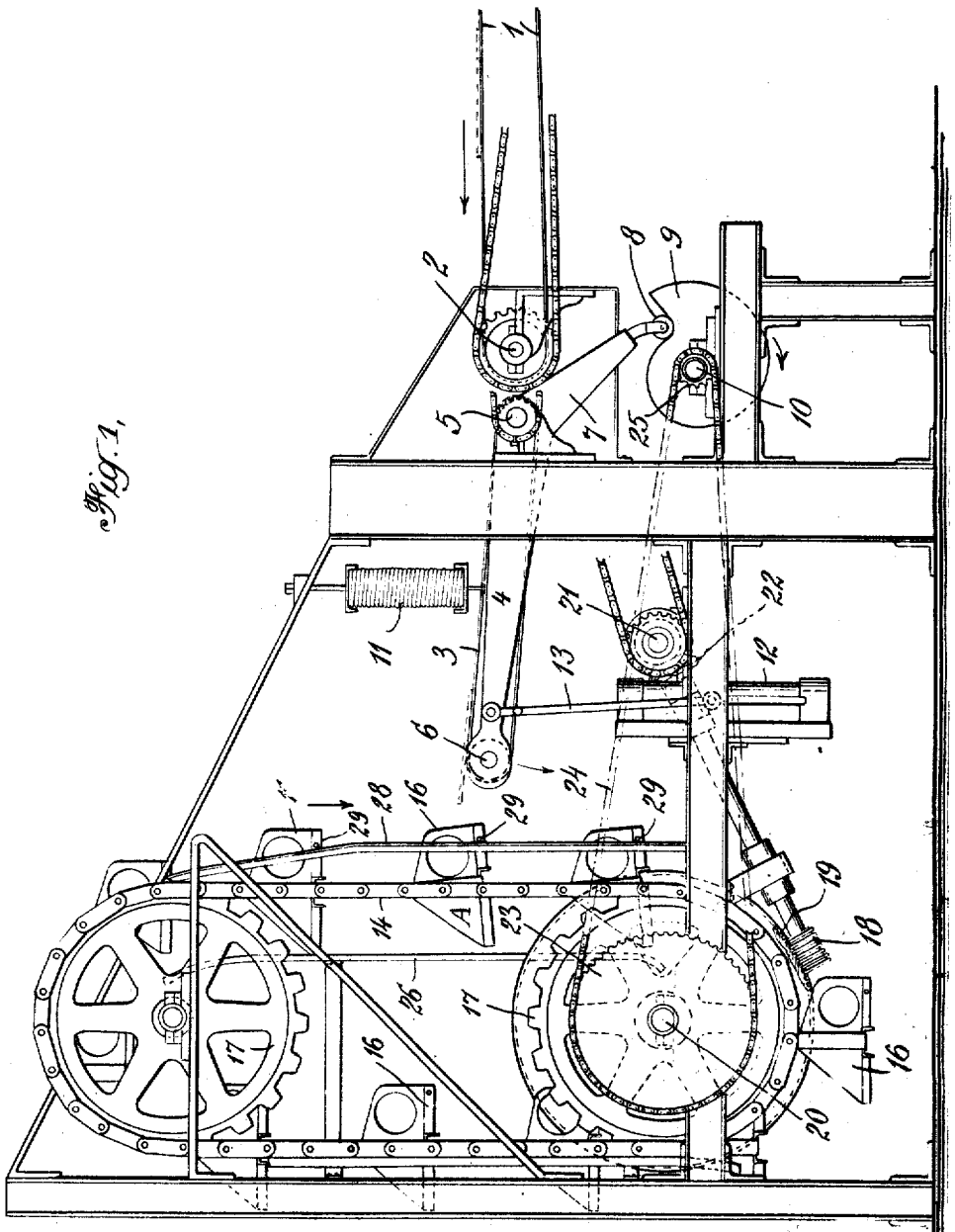


Fig. 1.

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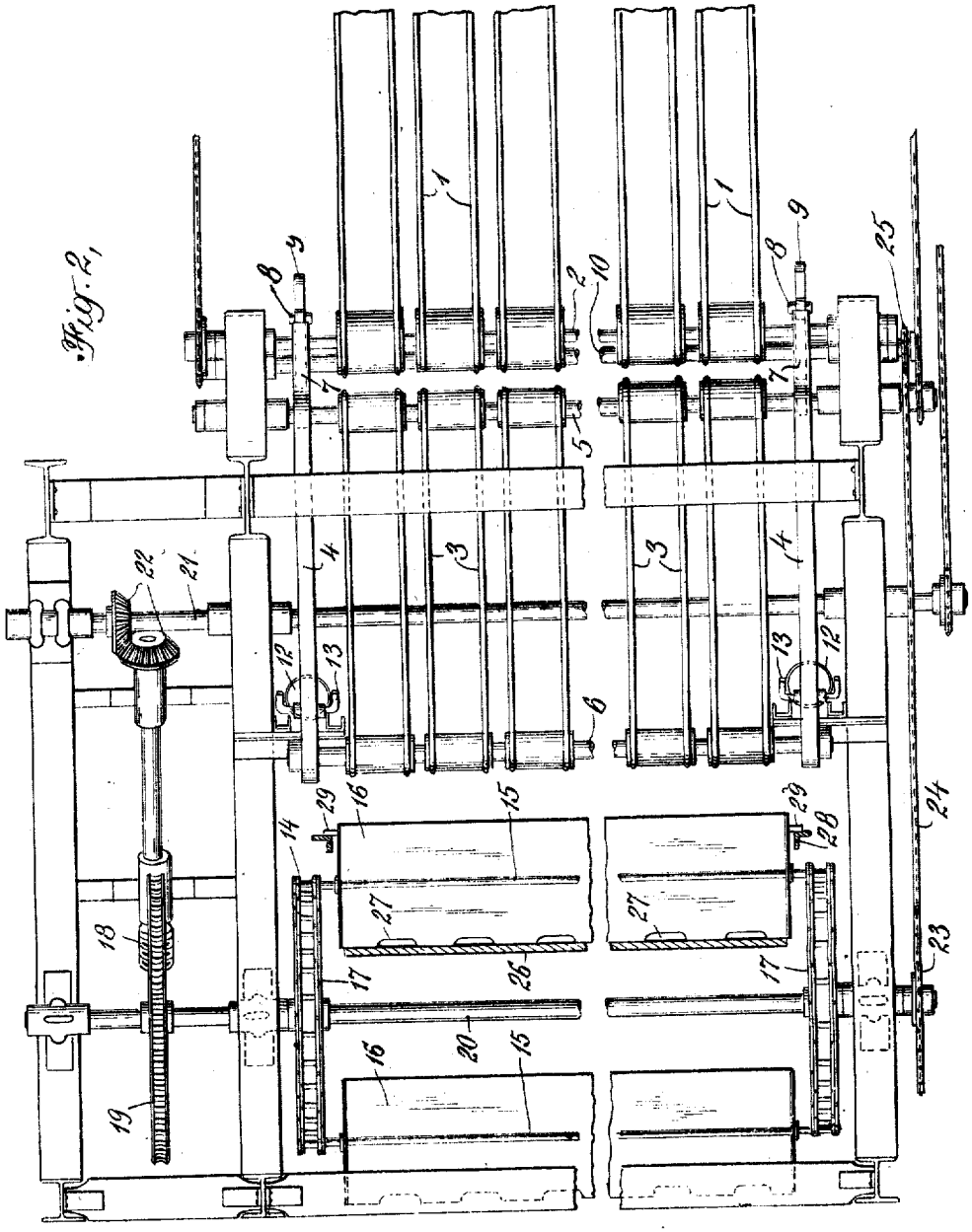
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SHINGLE STACKER

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Fig. 2.



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UNITED STATES PATENT OFFICE.

EDWARD T. STREET, OF JOLIET, ILLINOIS, ASSIGNOR TO THE RUBEROID CO., A CORPORATION OF NEW JERSEY.

SHINGLE STACKER.

Application filed March 14, 1921. Serial No. 451,951.

To all whom it may concern:

Be it known that I, EDWARD T. STREET, a citizen of the United States, residing at the city of Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Shingle Stackers, of which the following is a specification.

This invention relates to an attachment for a shingle machine of the class in which a sheet of fibrous material impregnated with waterproofing composition is cut to form individual shingles or strip shingles of desired shape.

The object of the invention is to provide apparatus for delivering the shingles or strips in uniform stacks or piles each containing a predetermined number of units, which stacks can be conveniently removed and readily handled.

While the apparatus is intended primarily for use in stacking shingles or strips, and is described herein particularly with reference to such application, it is to be understood that it may be employed for delivering and stacking other articles of merchandise.

The invention consists in certain novel features of construction, arrangement and combination of parts, hereinafter set forth and pointed out in the appended claims.

In the accompanying drawing, illustrating a preferred embodiment of the invention,

Figure 1, is a side elevation of the delivering and stacking apparatus, and,

Fig. 2, is a plan view thereof.

The apparatus, generally speaking, consists of a conveyor, shown at the left hand end of the drawings, which travels in clockwise direction and has a series of trays upon which the articles are stacked; a series of endless belts, indicated at the right hand end of the drawings, on which the articles are transported from the forming machine, (not shown); and, a second series of belts mounted on a swinging frame and disposed between said parts, whereby the articles are carried from the first-mentioned belts on to the conveyor trays. The swinging frame is arranged to follow the downward movement of each tray, but at a differential rate of speed, so as to deposit successively a predetermined number of the articles on the tray and to compensate for the gradual increase in height of the pile or stack thus formed.

Referring now to the drawings, the shingles or strips, which are indicated by dotted lines in Fig. 1, are carried in the direction of the arrow on a series of endless belts 1 mounted on pulleys borne on the shaft 2, which belts deliver the shingles from the cutting or forming machine (not shown) to a second series of belts 3, in alignment with the first-mentioned series and mounted on a swinging frame hereafter described.

In making individual shingles or strip shingles of the character having projections or tabs along one or both of the edges, much difficulty has been experienced in removing the waste material formed in cutting the tabs. I have found that by providing the apparatus with narrow belts, spaced apart, the waste material will drop through the spaces between adjacent belts as the shingles or strips are being carried thereon. For this reason I prefer to employ narrow belts 1 and 3, as shown, although wider belts may be used if desired.

The swinging or pivoted frame upon which the endless belts 3 are mounted comprises a pair of side members or arms 4 pivotally supported on the transverse shaft 5 and carrying at their outer ends the revoluble shaft 6. The belts 3 are preferably mounted on pulleys borne on said shafts and driven by rotation of the shaft 5. The side frame members 4 have extensions 7 which bear, through rollers 8, on the cams 9 fixed to the cam shaft 10. The cams are designed to tip or tilt the frame gradually downwards as required in stacking the shingles. Suitable means, such as the coil spring 11, are provided to effect the return movement of the frame, and dash pots 12, of usual construction, connected through links 13 with the frame members 4 are provided to check rebounding of the frame so as to prevent any of the shingles or strips which are being carried on the frame at the time of its return movement from being dislodged.

The conveyor comprises a pair of endless chains 14 having cross links 15 at equidistant intervals from which links the trays 16 are suspended. The chains are carried on sprocket pairs 17 mounted one above the other and are rotated in clockwise direction by means of the worm 18 and worm gear 19, which gear is fastened to the shaft 20 on which the lower sprocket pair 17 are mounted. 21 indicates the driving shaft of the

apparatus having means, such as the beveled gears 22, by which the worm is turned. Driving means, preferably comprising the sprocket 23 fastened to the shaft 20 and connected by the chain 24 with the sprocket 25 on the cam-shaft 10, are provided to rotate the cams 9 in correct differential time relation to the rotation of the conveyor.

As any of the trays, for example the tray A, comes to a position opposite to the outer end of the frame, while the latter is in the initial position shown in Fig. 1, the first row of shingles or strips will be deposited thereon. Now as the tray continues its downward movement the frame will tilt downwards synchronously therewith, but at a slower rate of speed, so as to permit the belts 3 to deposit a predetermined number of units in stacks or piles on the tray, a backing plate 26 being provided to assist in properly stacking the articles. When the tray is loaded the frame will return to its initial position in readiness for the succeeding cycle of operation.

The loaded trays are carried around to the rear of the conveyor where the stacks are removed by the workmen. To facilitate removal of the stacks the trays are preferably formed with hand-openings 27 in their rear edges as shown in Fig. 2.

In operating with certain classes of articles, such as individual shingles, I have found that the stacking is improved by slightly tilting the trays while they are receiving their charge. To this end I have provided guide-ways 28 on which the pins 29, fastened in the ends of the trays, ride. If desired the guides may be omitted.

Various changes or modifications in the details of construction and arrangement of parts herein-described may be resorted to without departing from the scope or spirit of my invention.

What I claim is:

1. In apparatus of the character described, a vertical band conveyor carrying equally spaced receptacles, a frame pivoted to rock on a horizontal axis and having a free end disposed adjacent to the downward reach of the conveyor, endless belts extending longitudinally of the frame, actuating means operative to tilt the frame synchronously with a portion of the downward travel of each successive receptacle but at a slower rate of motion, and means for restoring the frame to initial position between successive operations.

2. In apparatus of the character described, a vertical band conveyor carrying equally spaced receptacles, a frame pivoted to rock on a horizontal axis and having a free end disposed adjacent to the downward reach of the conveyor, endless belts extending longitudinally of the frame, actuating means operative to tilt the frame synchronously with a portion of the downward travel of each successive receptacle, resilient means for restoring the frame to initial position between successive operations, and cushioning means to check rebounding of the frame.

3. In apparatus of the character described, a vertical band conveyor carrying equally spaced receptacles, a backing plate parallel and adjacent to the rear edges of the receptacles on the downward reach, a frame pivoted to rock on a horizontal axis and having a free end disposed adjacent to said downward reach, endless belts extending longitudinally of the frame, actuating means operative to tilt the frame synchronously with a portion of the downward travel of each successive receptacle but at a slower rate of motion, and means for restoring the frame to initial position between successive operations.

4. In apparatus of the character described, a vertical band conveyor carrying a series of horizontally suspended receptacles, guideways for tilting the receptacles while traveling on the downward reach, a frame pivoted to rock on a horizontal axis and having a free end disposed adjacent to said reach, endless belts extending longitudinally of the frame, actuating means operative to tilt the frame synchronously with a portion of the downward travel of each successive receptacle but at a slower rate of motion, and means for restoring the frame to initial position between successive operations.

5. In apparatus of the character described, a vertical band conveyor, a frame pivoted to rock on a horizontal axis and having a free end disposed adjacent to the downward reach of the conveyor, endless belts extending longitudinally of the frame, cams operative to tilt the frame, and means for rotating the cams in correlation with the rotation of the conveyor but at a differential rate of speed.

6. In apparatus of the character described, the combination of a vertically movable substantially horizontal receptacle, and an endless belt conveyor movable angularly in correlation with the downward movement of the receptacle for depositing successively a plurality of articles thereon.

7. In apparatus of the character described, the combination of a vertically moving band conveyor carrying suspended receptacles, a second band conveyor mounted for angular movement in a vertical plane and having its delivery end disposed adjacent to the downward reach of the first mentioned conveyor, and means for angularly moving the second conveyor in correlation with a portion of the downward movement of each receptacle successively.

8. In apparatus of the character de-

scribed, the combination of a conveyor comprising a series of horizontally moving endless belts, a second conveyor comprising a pair of vertically moving endless chains carrying between them a series of suspended trays, and a third conveyor comprising an angularly movable frame carrying a series of endless belts disposed in alinement with the belts of the first-mentioned conveyor, the third-mentioned conveyor being arranged to receive articles from the first-mentioned conveyor and to stack them on the trays of the second-mentioned conveyor.

9. In apparatus of the character described, the combination of a conveyor comprising a pair of vertically moving endless chains carrying between them a series of suspended trays, and means for stacking articles upon said trays comprising an angularly moving band conveyor having its delivery end arranged to follow the downward motion of each successive tray through a predetermined portion of said motion but at a slower rate of speed.

EDWARD T. STREET.