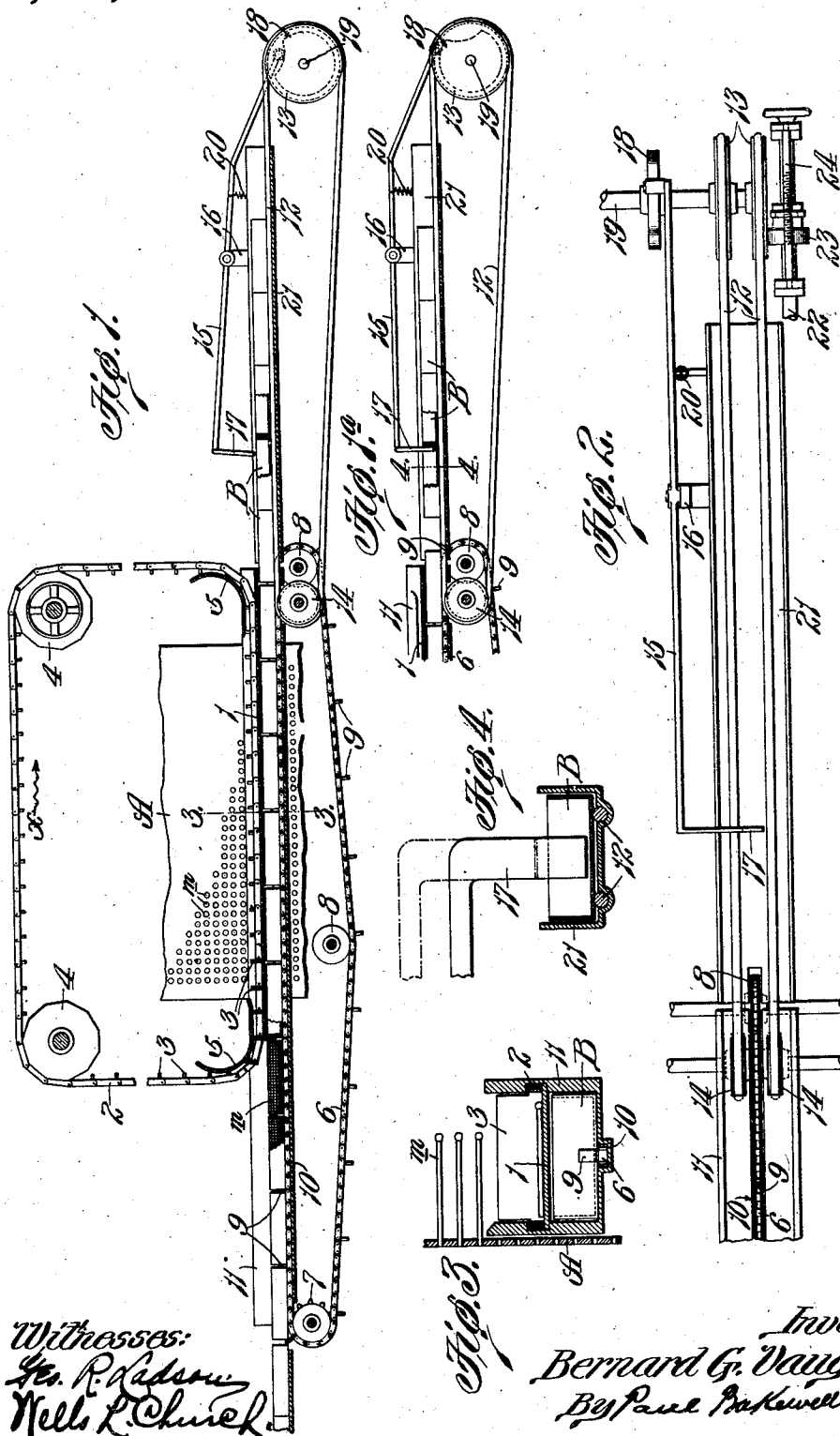


B. G. VAUGHAN.
BOX FILLING MACHINE.
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1,010,828.

Patented Dec. 5, 1911.



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UNITED STATES PATENT OFFICE.

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BOX-FILLING MACHINE.

1,010,828.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, BERNARD G. VAUGHAN, a citizen of the United States, residing at Joliet, Illinois, have invented a certain new and useful Improvement in Box-Filling Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines for filling boxes with matches, tooth-picks or articles of a similar shape, and particularly to machines which are adapted to be arranged adjacent a match-making machine so as to automatically box the matches as they are discharged from the carrier of the match-making machine.

One object of my invention is to provide a match-box-filling machine of simple construction which is so designed that there is no liability of the boxes becoming jammed or bent out of shape while they are being fed through the machine.

Another object is to provide a match-box-filling machine which is so designed that a line or string of boxes will be fed continuously past the end of a trough or similar device from which a continuous stream of matches flows. And still another object is to provide a box-filling machine that comprises a continuous feeding mechanism which causes a line or string of boxes to move continuously past a delivery point, and automatic means for causing empty boxes to move intermittently into position to be engaged by said continuous feeding mechanism.

Figure 1 is a vertical longitudinal sectional view of a box-filling machine constructed in accordance with my invention; Fig. 1^a is a similar view of a portion of the machine showing the box-arresting device in operative position; Fig. 2 is a top plan view of the machine; Fig. 3 is an enlarged vertical cross sectional view taken on approximately the line 3—3 of Fig. 1; and Fig. 4 is a vertical cross sectional view taken on approximately the line 4—4 of Fig. 1^a.

Referring to the drawings which illustrate the preferred form of my invention, A designates the match-carrier of a match-making machine which is composed of a plurality of perforated plates that travel in a vertical plane, as shown in Figs. 1 and 3, the matches *m* being discharged from said car-

rier onto a horizontally disposed plate 1 by some suitable means not shown. The matches are fed longitudinally over the plate or supporting member 1 and assorted or arranged in parallel relation to each other by means of a combined feeding and assorting device which, in the embodiment of my invention herein shown, consists of a pair of sprocket chains 2 and cross links or plates 3 connected to said chains in such a manner that they form practically a plurality of pockets into which the matches are discharged from the carrier A, said combined feeding and assorting device being mounted in sprocket wheels 4 and curved guides 5 which are located above the plate 1 adjacent the opposite ends of same, as shown in Fig. 1. Said combined feeding and assorting device travels continuously in the direction indicated by the arrow *x* in Fig. 1 and thus operates to feed a stream of matches continuously from the lefthand end of the plate 1, and means is provided for continuously feeding a string or line of empty match-boxes past the lefthand end of the plate 1 so as to receive the matches that are discharged from said plate. The box-feeding means herein shown consists of a sprocket chain 6 mounted on a drive sprocket 7 and idlers 8 and provided with tongues or projections 9 that are spaced apart a distance approximately equal to the length of a match-box B, said sprocket chain being arranged to travel in a guideway 10 formed in the bottom of a box-guideway 11 that extends longitudinally under the plate 1 onto which the matches are discharged from the match-making machine. In the embodiment of my invention herein shown, the side walls of the box-guideway 11 are extended upwardly so as to form a support for the plate 1 and cooperate with said plate to form a trough through which the combined feeding and assorting device travels, the sprocket chains 2 of said device being arranged in guideways formed in the inner faces of said side walls, as shown clearly in Fig. 3.

Various means may be employed for feeding the empty boxes onto the continuous feeding mechanism or sprocket chain 6, such, for example, as a pair of endless belts 12, arranged in longitudinal alinement with the box-guideway 11 and at the righthand end of same, drive pulleys 13 and idlers 14, 110

around which said belts 12 pass, and a device for momentarily arresting the movement of the empty boxes on said belts when they approach the box-guideway and then permitting said empty boxes to pass one by one onto the continuous feeding mechanism 6. One form of device that I have found very efficient for momentarily arresting the movement of the empty boxes as they approach the righthand end of the box-guideway 11, consists of a lever 15 fulcrumed on a stationary support 16 and provided at one end with a downwardly projecting arm 17 that moves downwardly into the path of the empty boxes on the belts 12 when the opposite end of said lever 15 is raised by the cam 18 secured to the shaft 19 which carries the drive pulleys 13, said lever being held in engagement with said cam by means of a coiled contractile spring 20.

The operator places the empty boxes B on the belts 12 which preferably travel at a higher speed than the sprocket chain 6, said belts operating to move the empty boxes toward the righthand end of the box-guideway 11. The cam 18 is so formed that the arm 17 on the lever 15 will descend or move downwardly into the position shown in Fig. 1^a and thus temporarily arrest the forward movement of the empty box just before the box reaches the entrance end of the box-guideway, said arm thereafter moving upwardly into the position shown in Fig. 1 so as to release the box and permit it to move onto the chain 6. The second empty box that passes under the arm 17 will likewise be temporarily arrested so as to provide sufficient time for the lug or projection 9 on the sprocket chain 6 to engage the rear end of the box. By intermittently feeding the empty boxes to the chain 6 in this manner I overcome the possibility of the boxes becoming jammed or wedged so tightly together that it is impossible for the projections 9 on the chain to pass between the adjacent ends of the boxes. The belts 12, as previously stated, travel at a higher rate of speed than the sprocket chain 6 so that the boxes shoot onto the sprocket chain 6 as soon as they are released by the lever 15, and as said lever is operated automatically no special skill or attention is required on the part of the operator to govern the feeding of the boxes to the feeding mechanism, the operator merely placing the empty boxes one by one onto the belts 12 which travel longitudinally over the bottom of the receiving guideway 21 that is arranged in longitudinal alinement with the guideway 11 through which the sprocket chain 6 travels.

A box-filling machine of the construction above described comprises only a few parts of simple construction so that it is not apt to get out of order easily, it is so constructed

that there is no liability of the boxes becoming jammed or bent out of shape while they are being fed to the point where the matches are introduced into the same, and it insures a sufficient number of empty boxes being fed past the delivery point to box the entire output of the match-making machine with which it is used.

The shaft 19 to which the pulleys 13 and cam 18 are connected can be driven in various ways, and, if desired, means may be employed for varying the speed of said shaft. The means herein shown for driving the shaft 19 consists of a driven shaft 22 provided with a friction wheel 23 that bears against the side face of one of the pulleys 13, or against a disk on the shaft 19. The friction wheel 23 can be adjusted longitudinally of the shaft 22 by means of the device 24, so as to move said wheel 23 toward or away from the periphery of the pulley 13 or disk with which it coöperates, thereby enabling the speed of the belts 12 and the arresting device 15 to be varied so as to accommodate boxes of different lengths.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a box-filling machine, a continuously operating endless conveyer provided with spaced box-engaging devices, a high-speed conveyer arranged in longitudinal alinement with the conveyer first referred to for receiving empty boxes and moving them toward said first conveyer, and a pivotally mounted device for temporarily arresting the movement of the boxes on said high-speed conveyer so as to permit boxes to pass one by one onto the conveyer first referred to.

2. In a box-filling machine, a horizontally disposed trough-shaped support for receiving the articles to be boxed, means for feeding the articles longitudinally through said support and arranging them in an orderly manner, and a continuously operating means for causing a line or row of empty boxes to pass the end of said support from which the articles are discharged.

3. In a match-box-filling machine, a comparatively long trough-shaped support for receiving the matches from a match-making machine, means for feeding the matches over said support and discharging them from one end of same, a continuously operating means for causing a row or line of boxes to travel under said support and past the end thereof from which the matches are discharged, an endless conveyer on which the boxes are placed manually and which moves the boxes toward said feeding means, and means for permitting boxes to pass intermittently from said endless conveyer onto said continuously operating feeding means.

4. In a match-box-filling machine, a sup-

port which receives the matches from a match-making machine, a combined feeding and assorting means that arranges the matches on said support in an orderly manner and discharges them from said support, a continuously operating endless conveyer traveling past the discharge end of said support and provided with spaced box-engaging devices, and automatic means for intermittently feeding empty boxes onto said conveyer.

5. In a box-filling machine, a box guideway, a continuously operating endless conveyer provided with spaced box-engaging devices that travel through said guideway, a continuously operating feeding means arranged at one end of said guideway for introducing empty boxes into same, and an intermittently operating pivotally mounted device that cooperates with said feeding means to cause the empty boxes to pass one by one into said guideway and thus be arranged between the box-engaging devices on said conveyer.

6. In a box-filling device, a box-guideway, a continuously operating endless conveyer provided with spaced box-engaging devices that travel through said guideway, a receiving trough arranged at one end of said guideway and in longitudinal alinement with same, an endless belt traveling longitudinally through said trough for feeding empty boxes toward said conveyer, a device for temporarily arresting the movement of the boxes through said trough, and means for operating said device intermittently so as to permit the boxes to pass one by one onto said conveyer.

7. In a match-box-filling machine, a comparatively long support arranged to receive the matches that are discharged from a match-making machine, a combined feeding

and assorting means that arranges the matches on said support in an orderly manner and discharges them from one end of the support, a box-guideway arranged under the support, a continuously operating conveyer provided with spaced box-engaging devices that travel longitudinally through said box-guideway, a receiving trough arranged at one end of said box-guideway and in longitudinal alinement with same, a belt that travels through said receiving trough at a higher speed than said conveyer, a box-arresting device arranged adjacent said receiving trough, and means for operating said device intermittently so as to cause it to temporarily arrest the movement of the boxes through said receiving trough.

8. In a box-filling machine, a box-guideway, a continuously operating endless conveyer provided with spaced box-engaging devices which travel longitudinally through said guideway, a receiving trough arranged at one end of said guideway and in longitudinal alinement with same, an endless belt traveling through said trough for feeding empty boxes toward said conveyer a pivotally mounted member having an arm which is adapted to enter the boxes on said belt and temporarily arrest the movement of said boxes, and a cam for operating said member intermittently so as to permit the boxes to pass one by one onto said continuously operating conveyer.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this 29 day of November 1910.

BERNARD G. VAUGHAN.

Witnesses:

LOUIS A. SHERWOOD,
HENRY LESER.