Oct. 26, 1937. J. H. WEBSTER 2,096,772

FEED CONTROL MECHANISM

Filed Dec. 8, 1936 2 Sheets-Sheet 1

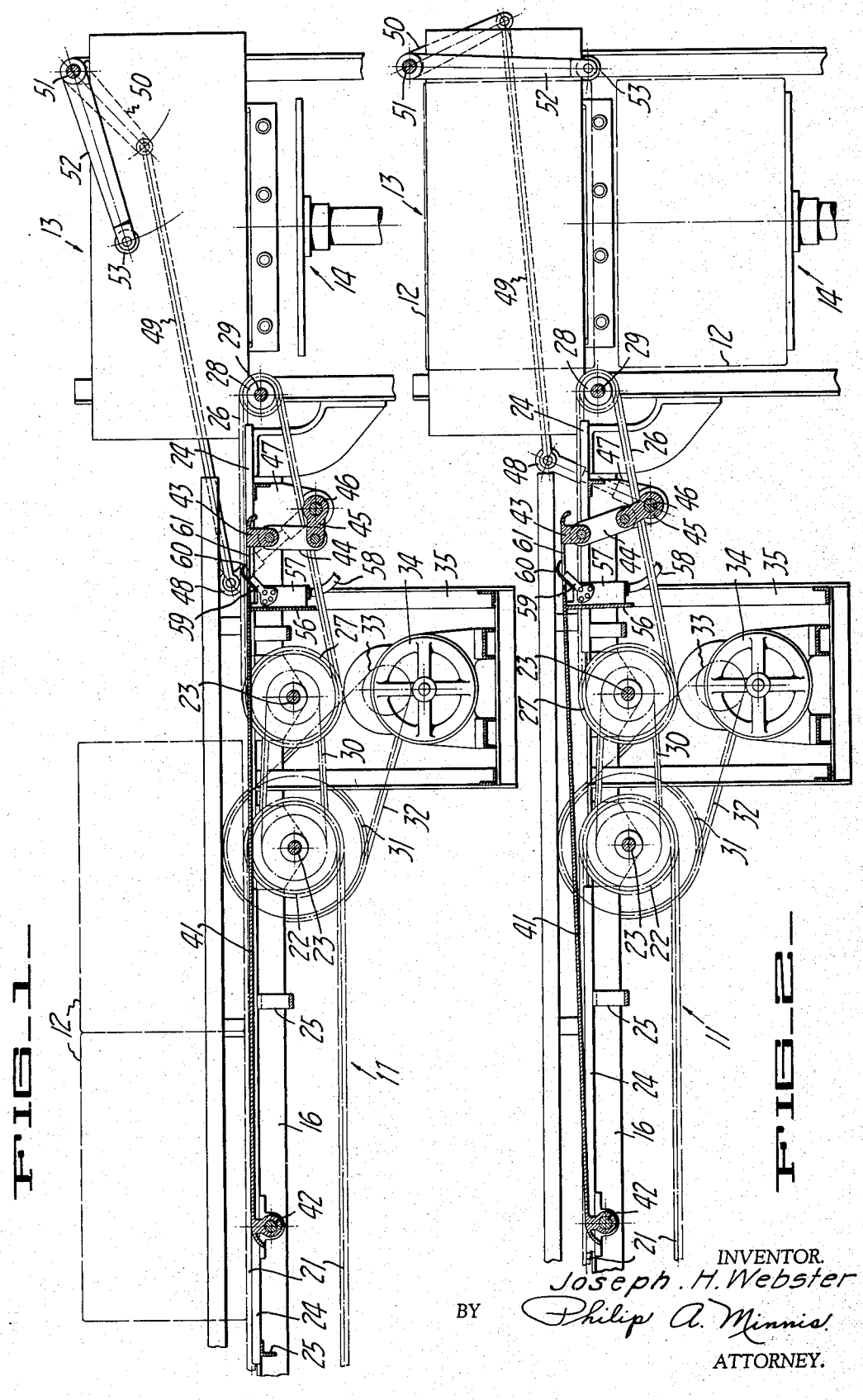


FIG. 1

FIG. 2

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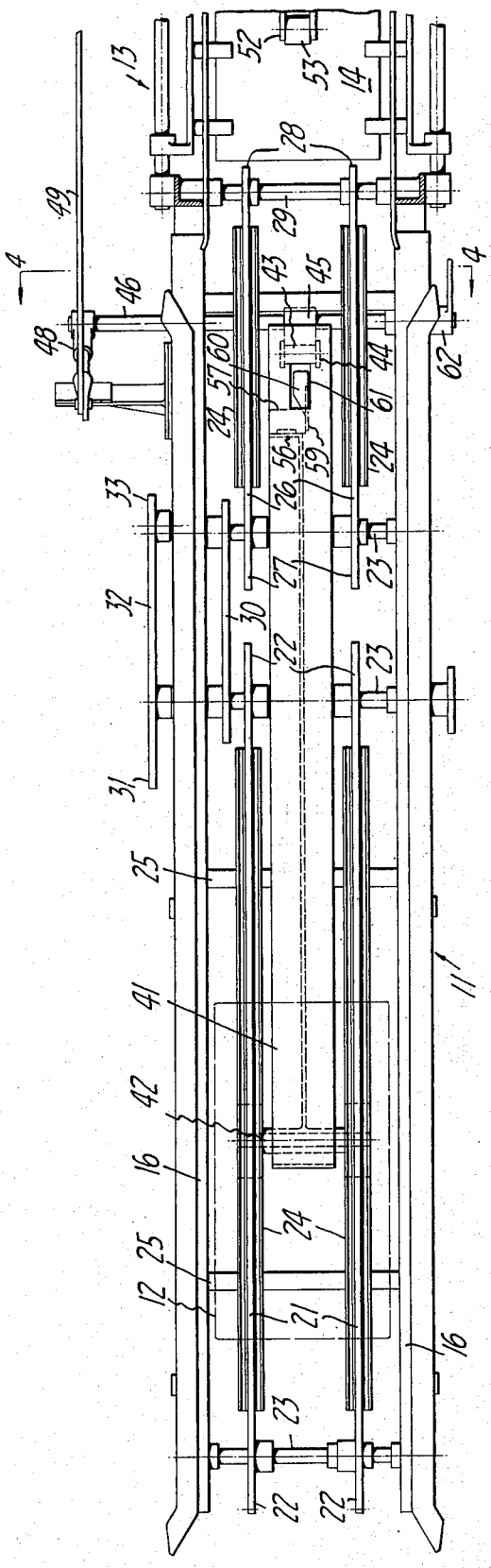


FIG. 3

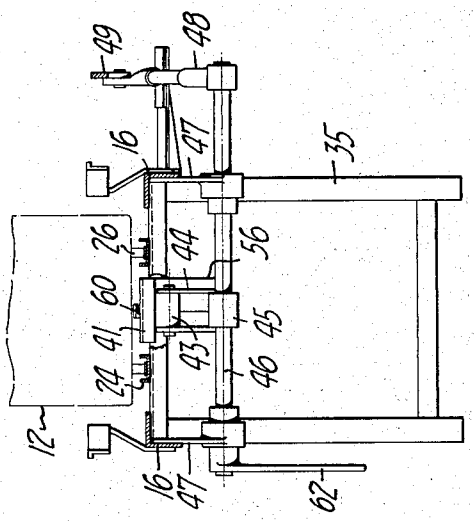


FIG. 4

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FEED CONTROL MECHANISM

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9 Claims. (Cl. 198—37)

This invention relates generally to apparatus for handling articles such as boxes, crates, and the like, and more particularly to an improved conveyor feed control mechanism for interrupting the feed of articles where an indiscriminate article flow is changed to an article-by-article feed, so that overfeeding to the article-by-article part of the apparatus will not occur.

It is a general object of the invention to provide an improved feed control mechanism of the character referred to, which interrupts the flow of articles in a simple yet positive manner.

Another object of the invention is to provide a feed control mechanism of the character referred to, which, while positive in its operation, handles the articles gently when the flow is interrupted, so as to avoid injury to articles of a more or less fragile nature.

Other objects will appear as the description progresses with reference to the accompanying drawings, in which:

Fig. 1 is a fragmentary sectional elevation of a box stacking machine employing the improved feed control mechanism of my invention as applied to such machines, the mechanism being shown in the position occupied thereby when the box trap is empty.

Fig. 2 is similar to Fig. 1, but illustrates the feed control mechanism as positioned with a box in the trap.

Fig. 3 is a fragmentary plan view of the machine with the feed control mechanism positioned as in Fig. 1.

Fig. 4 is a transverse sectional elevation of the machine with the feed control mechanism positioned as in Fig. 1, the view being taken in a plane indicated by the line 4—4 of Fig. 3.

The improved feed control mechanism of my invention can be employed in various types of article handling apparatus, but I have chosen to illustrate the mechanism as embodied in a box stacking machine of the character disclosed in the co-pending application of Harold C. Pierce, Serial No. 735,575, filed July 17, 1934. Only the parts of the box stacking machine which are considered necessary or desirable to the understanding of the construction and operation of my improved conveyor feed control mechanism are disclosed herein, it being considered unnecessary to illustrate the construction of more or less unrelated parts of the box stacking machine which do not affect the operation of the conveyor feed control mechanism.

The box stacking machine includes a trap delivery conveyor means indicated generally at 11, which is adapted to deliver articles such as crates or boxes 12 into a trap generally indicated at 13. Trap 13 is of conventional construction and operates in a well-known manner to deposit automatically the articles received therein onto a lowerator or platform generally indicated at 14. The lowerator moves downwardly in step by step manner as the articles are stacked thereon until a full stack of articles is received, after which the stack may be removed in any suitable manner, the lowerator being returned to the position illustrated in Fig. 1 to receive another stack.

The trap delivery conveyor means 11 includes a pair of side rails 16 which are suitably supported at the desired elevation with reference to the trap, and constitute the support for the various parts of the trap delivery conveyor means. The conveyor means per se may comprise two chain type conveyors. One of such conveyors is positioned to receive articles at the feed end of the trap delivery conveyor means, and may comprise a pair of chains 21 which are trained about suitable sprockets 22 carried by the transverse shafts 23 having their ends suitably journalled in the side rails. The upper stretches of the chains 21 are supported and guided in trackways 24 suitably mounted on cross braces 25 extending between the side rails. From the chains 21, the articles are transferred to the other and shorter of the conveyors comprising chains 26 which are trained about suitable sprockets 27 on a shaft 23 and smaller sprockets 28 on a shaft 29 journalled on the framework of the trap 13. Chains 26 also have their upper stretches supported by trackways 24. Both chains 21 and 26 extend above the trackways to engage and support boxes thereon. Adjacent shafts 23 for the respective chains 21 and 26 are interconnected by a chain and sprocket drive indicated generally at 30, shaft 23 also carrying sprocket 31 at one end thereof which is connected by chain 32 with small sprocket 33 suitably driven from the electric motor 34 which is mounted in a framework 35 depending from the side rails.

From the above description, it will be apparent that boxes delivered to the conveyor are carried by chains 21 from which they are discharged onto chains 26 for delivery to the trap 13.

In the event the trap is open in delivering a box to the lowerator, or if a box is contained in the trap or for any reason becomes jammed therein, means are provided to automatically stop the conveyor until such time as the trap is ready to receive another box, when the conveyor is again

automatically placed in operation. Such means includes a device which is first operated to render the conveyor ineffective with respect to a box which is ready for delivery to the trap, without interfering with the travel of other boxes on the conveyor, and which subsequently becomes effective to disable the conveyor drive, if successive boxes have lined up ready for delivery to the trap.

Such means preferably comprises a tongue 41 which extends between chains 21 and chains 26, and is normally positioned below the level of such chains as illustrated in Fig. 1, so that the boxes can travel freely thereover. The tongue 41 is pivotally mounted adjacent the feed end of the conveyor by shaft 42 suitably journalled in brackets secured beneath trackways 24. At its other end, tongue 41 is provided with a bracket portion 43 carrying a pivot pin for a pair of links 44, which extend downwardly, and have their lower ends pivotally connected to an arm 45 secured on a shaft 46 which is suitably supported in brackets 47 depending from the side rails.

As seen in Fig. 1, the arm 45 is positioned to maintain the tongue below the level of the conveyor so that boxes can travel freely thereover, and means are provided for oscillating the arm to raise the tongue above the level of the conveyor, such means being controlled by the box in the trap. At an extending end thereof, shaft 46 carries an arm 48, which is connected by a link 49 with an arm 50 secured at an end of a control shaft 51 on the trap 13. Substantially midway between the sides of the trap, the control shaft 51 has a control arm 52 extending downwardly into the trap and carrying a roller 53 for engagement with a box entering the trap. The control arm 52 may be urged to the position shown in Fig. 1 as by suitable spring means (not shown).

When a box enters the trap, the control arm 52 is swung from the position shown in Fig. 1 to that shown in Fig. 2, whereby, through the connecting linkage, the arm 45 is similarly actuated to lift the end of the tongue above the conveyor. This condition of the parts will be maintained so long as a box is in the trap, or is being deposited from the trap onto the lowerator, it being noted that the control arm will be held in the position thereof shown in Fig. 2 until the upper edge of the box passes below the roller 53.

With this condition of the parts, a box which is travelling along on the conveyor chains 21 ready for delivery to the trap will be lifted by the tongue off the conveyor which is thereby rendered ineffective with respect to such box. However, a succeeding box will be carried along until it contacts the box which is free from the conveyor and pushes it further along the tongue. Such further movement of a box which has been lifted off the conveyor is utilized to render effective the conveyor arresting means whereby the conveyor drive is disabled. The tongue 41 carries a depending bracket 56, (Figs. 1 and 2) having a limit switch 57 of conventional construction mounted thereon. From the limit switch, a connection 58 extends and is suitably connected with the motor circuit so that, when the limit switch is operated, the motor circuit is broken. To effect this control, the limit switch has a movably mounted control arm 59 carrying a projecting skid portion 60 which extends through an aperture 61 in the tongue, for engagement by a box slid along the tongue.

As long as the tongue is positioned as shown in Fig. 1, the skid 60 is below the bottom of the box on the conveyor so that the motor circuit is not broken. However, when the tongue is lifted as shown in Fig. 2, the skid or switch control arm is also moved to effective position with reference to a box on the tongue so that the motor circuit will be broken when a box contacts the skid. It will be evident also that lowering of the tongue back to the position shown in Fig. 1 will reestablish the conveyor drive by allowing the control arm to resume its normal position below the boxes, and also place the boxes in operative position on the conveyor. This condition obtains whenever the trap is empty.

If it is desired to stop the operation of the conveyor feed mechanism at any time, the shaft 46 is provided at one end with a manually operable handle 62 whereby the tongue can be elevated to interrupt the operation of the feed mechanism.

It will be noted that the entire control of the feed mechanism is effected by engagement with the leading end or the bottom of a box or other article so that the contents of a box can not be injured and so that the interruption of movement of the boxes is effected in a simple yet gentle manner whereby the contents will not be injured.

While I have shown and described my invention in connection with a preferred embodiment thereof, and in connection with a box stacking machine, it is to be understood that the invention may be embodied in other forms and may be employed in other types of machines. The scope of my invention, therefore, should be limited only by the proper scope and interpretation of the appended claims.

I claim:

1. Feed mechanism for an article handling apparatus, comprising a conveyor for delivering articles to said apparatus, a tongue for lifting an article off said conveyor, means for operating said conveyor including a switch, a lever carried by said tongue for controlling said switch, and means actuated by an article received in said apparatus for raising said tongue to position said lever in the path of a succeeding article on said tongue.

2. Feed mechanism for an article handling apparatus, comprising a conveyor for delivering articles to said aparatus, drive means for said conveyor, means for lifting an article off said conveyor to prevent advance thereof by said conveyor, means controlled by an article in said apparatus for operating said lifting means, and means for disabling said drive means including a control member movable into the path of a succeeding article on said conveyor by operation of said lifting means.

3. Feed mechanism for an article handling apparatus having an article handling station, comprising a conveyor for delivering articles to said station, drive means for said conveyor, means adjacent said station for lifting an article off said conveyor to prevent advance thereof by said conveyor, means controlled by an article at said station for operating said lifting means, and means for disabling said drive means including a control member movable with said lifting means into and out of the path of a succeeding article on said conveyor.

4. Feed mechanism for an article handling apparatus, comprising a conveyor for delivering articles to said apparatus, drive means for said conveyor, means for lifting an article to prevent advance thereof by said conveyor, means controlled by an article in said apparatus for operating said lifting means, and means for dis-

abling said drive means including a control member movable with said lifting means into and out of the path of a succeeding article on said conveyor.

5. Feeding means for providing a controlled flow of articles, comprising a conveyor, drive means for said conveyor, controllable means for lifting an article off said conveyor to prevent discharge thereof by said conveyor, and means for disabling said drive means including a control member movable with said lifting means into and out of the path of article on said conveyor means.

6. Feeding means for providing a controlled flow of articles, comprising a conveyor, drive means for said conveyor, controllable means for lifting an article off said conveyor to prevent discharge thereof by said conveyor, and means for disabling said drive means including a control member carried by said lifting means and normally positioned below the path of articles entrained with said conveyor.

7. Feeding means for providing a controlled flow of articles, comprising a conveyor, a tongue for lifting an article off said conveyor, means for operating said conveyor including a switch, and a control lever for said switch carried by said tongue and movable therewith into the path of an article lifted by said tongue.

8. Feeding means for providing a controlled flow of articles, comprising a conveyor, a tongue for lifting an article off said conveyor, means for operating said conveyor including a switch, and a control lever for said switch movable by said tongue into and out of the path of an article on said conveyor.

9. In combination, a conveyor for delivering articles, said conveyor including driven members adapted to support and move articles thereon, means at the delivery end of said conveyor for actuation by an article delivered from said conveyor for raising an article on said conveyor out of contact with said driven members, and conveyor arresting means movable into the path of an article in raised position on said conveyor by operation of said article raising means.

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