Nov. 8, 1932. P. HUNZIKER 1,887,023

BAG STACKING APPARATUS

Filed Dec. 3, 1930 3 Sheets-Sheet 1

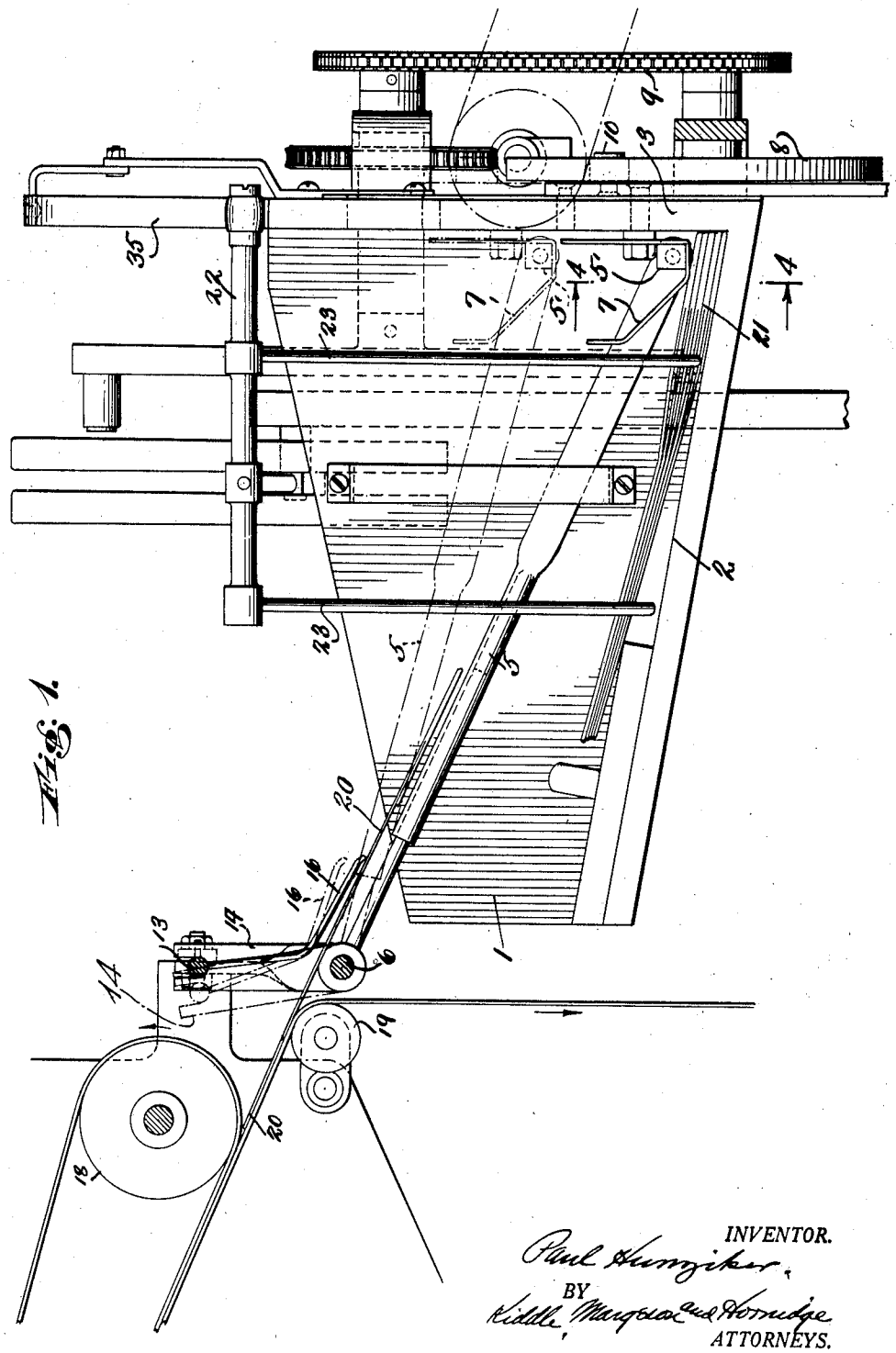


Fig. 1.

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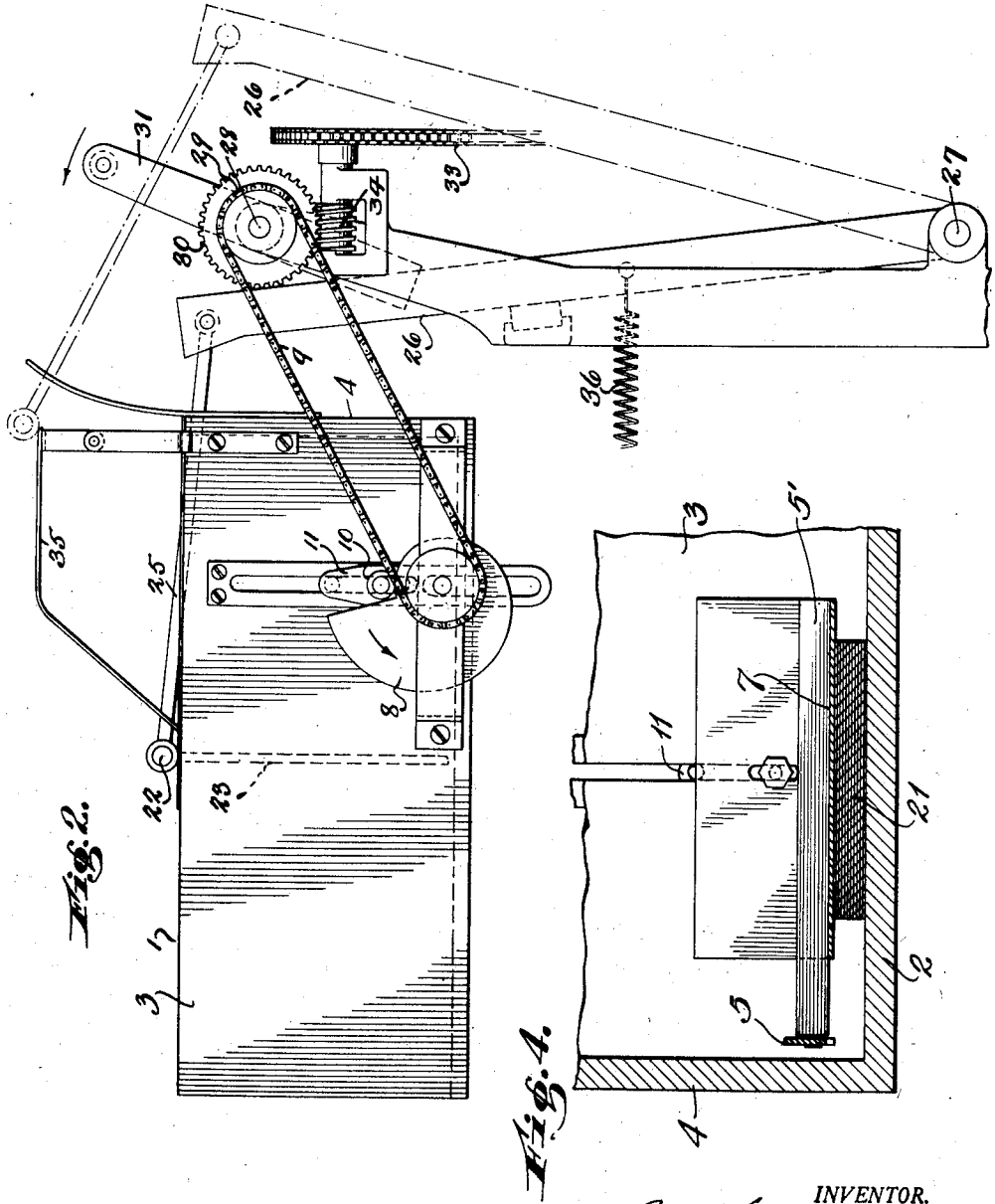


Fig. 2.

Fig. 4.

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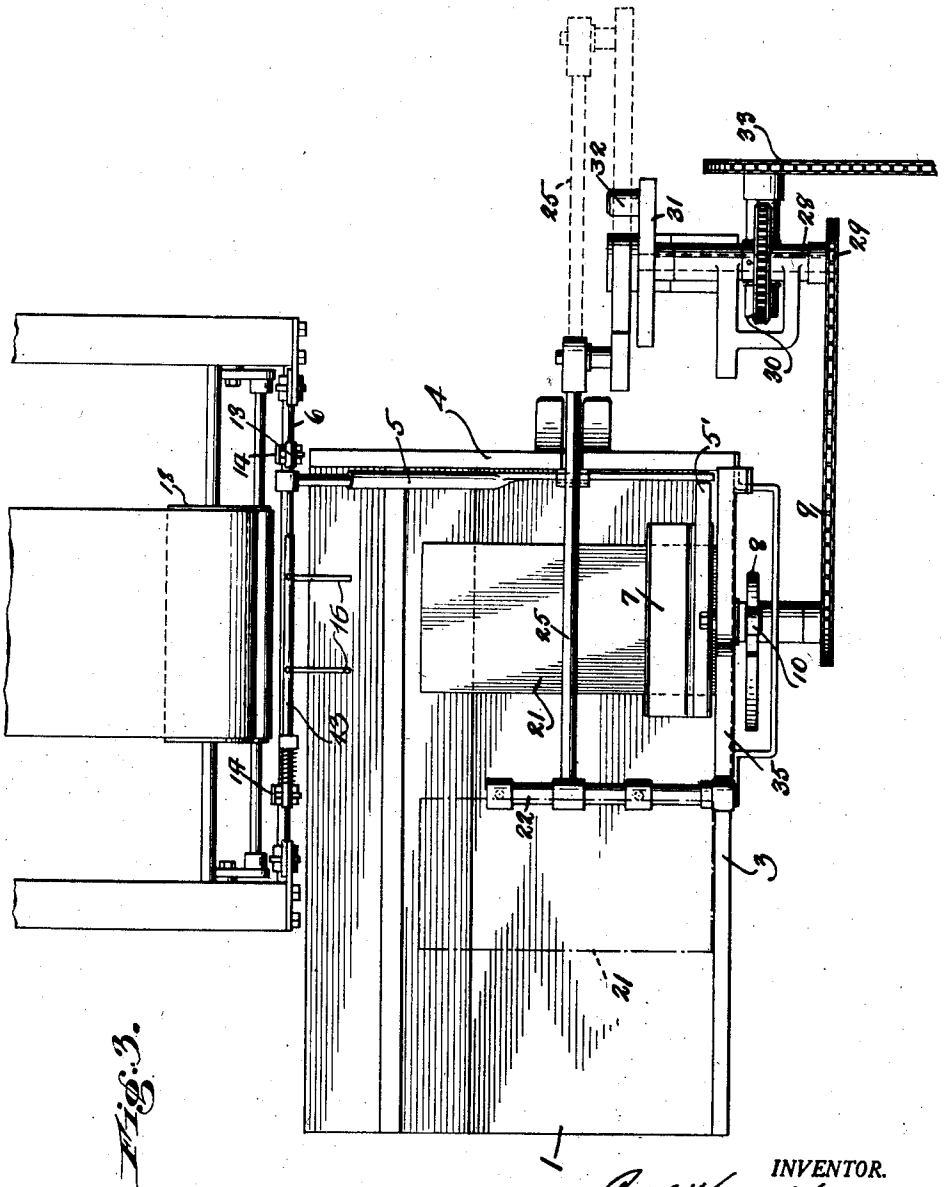


Fig. 3.

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UNITED STATES PATENT OFFICE

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BAG STACKING APPARATUS

Application filed December 3, 1930. Serial No. 499,637.

This invention relates to an improved apparatus for use in connection with bag stacking machines, and has for one of its objects the provision of stacking mechanism of improved construction by which the bags will be stacked more accurately and compactly than with prior stacking devices.

In the drawings accompanying this application:

Fig. 1 is a side elevational view of an embodiment of my invention;

Fig. 2 is an end elevational view of Fig. 1 looking from right to left;

Fig. 3 is a plan view of Fig. 1; and

Fig. 4 is a section on the line 4—4 of Fig. 1.

Referring to the drawings in detail, my improved apparatus comprises a trough-shaped bag receiver 1 provided with a bottom 2, end wall 3 and a side wall 4.

Extending transversely of the receiver in the direction of the bag travel, and adjacent the end wall 4, is a bar 5 mounted on a shaft 6 which extends lengthwise of the receiver as viewed in Fig. 3. The free end of this bar, i. e., the end remote from the shaft 6 carries a member 5′ to which is secured a plate 7 extending at right angles to the bar, and hence lying transversely of the bag travel. This plate is of such length as to lie above the bag stack and to deflect the bags downwardly as the same are deposited in the bottom of the receiver.

The inner end of bar 5 is gradually moved upwardly through the medium of a cam 8 driven by chain 9. This cam cooperates with a cam follower 10 attached to the plate 7 by an arm 11 or by any other suitable means. The cam 8 rotates in the direction of the arrow on Fig. 2 and is of such shape that the bar 5 together with plate 7 are raised very slowly, just sufficiently to keep the plate in contact with the bags as the stack of bags builds up.

Above the shaft 6 is a shaft 13 mounted in brackets 14 fixed to the shaft 6. The shaft 13 carries guide or deflecting fingers 16.

By this arrangement as the cam 8 effects an upward movement of the free or inner end of the arm or bar 5 the guide fingers 16 will be swung about the axis of the shaft 6, the relation of the fingers 16 to the bar remaining unchanged.

18 and 19 designate discharge conveyors mounted to the rear of plate 7, these conveyors discharging the finished bags 20 successively into the receiver.

It will be understood that the bags as they are discharged into the receiver come to a stop against wall 3, being directed by the fingers 16 which, as above explained, move slowly upwardly so as to enable the bags to build up in stack form. The plate 7 it will be seen from Fig. 1 is bent upwardly to guide the front edge of each bag and deflect it downwardly, thereby insuring stacking of the bags in a compact pile. The plate 7 at all times exerts a slight pressure on the top of the bag stack which is designated 21 and prevents an incoming bag from rebounding.

After a stack has been completed apparatus comes into operation to move the stack of bags to one side.

In this connection 22 designates a bar extending parallel to the bag stack and carrying a plurality of depending arms 23. This bar lies slightly above the upper edge of the receiver 1. The bar is carried at the end of a long arm 25 extending at right angles to the bar, the arm being attached to the bar midway of its ends. When not in operation the outer end of the bar 22 rests on the upper edge of the wall 4 of the receiver.

26 designates a rocking lever pivoted at 27 to which the outer end of the arm 25 is attached.

28 designates a shaft carrying a sprocket 29 for the chain 9 heretofore referred to. The shaft 28 also carries a worm gear 30 and an operating arm 31, provided at one end with a roller 32. 33 designates a main drive chain, this chain driving a worm 34 meshing with the worm gear 30. As the worm gear 30 and shaft 28 are rotated the operating arm 31 will be swung around to cause roller 32 to engage the face of the lever 26 to move the lever 26 to the right, as viewed in Fig. 2, to the position shown in dotted lines in said figure.

This causes the outer end of the bar 22 to move along the face of a cam 35 pivotally mounted on the upper edge of receiver 1, and

which cam is so shaped as to cause the bar to be raised from the full line position of Fig. 2 to the dotted line. This movement of the bar lifts the arms 23 upwardly and to one side, so that finally when the bar rides off the rear end of the cam 35 the bar will drop the arms 23 into position behind the stack of bags. Continued movement of the worm 34 will finally carry the roller 32 out of engagement with the lever 26 so that the latter can return to its original position under the action of spring 36, the arms 23 engaging the bag stack 21 on the way and pushing the same to one side as shown in dotted lines in Fig. 3.

It will be understood, of course, that the entire mechanism is so timed that the bags will be stacked by the time the arms 23 have been moved to position behind the stack and that by the time the first bag of the next stack to be formed is to be delivered to the receiver 1 the spring 36 will have returned the lever 26 and hence the bar 22 to its original full line position of Fig. 2.

It is to be understood that changes may be made in the details of construction and arrangement of parts within the spirit and scope of my invention.

What I claim is:—

1. Bag stacking apparatus comprising in combination a receiver for the bags, delivery means for delivering bags to the receiver, guiding means for directing the bags into the receiver, and means for gradually elevating the guiding means with respect to the delivery means as the stack builds.

2. Bag stacking apparatus comprising in combination a receiver for the bags, means for delivering bags to the receiver, pivoted guiding or directing fingers disposed adjacent the bag delivery means for directing the bags into the receiver, and means for moving said fingers about their respective pivots relatively to the said delivery means as the bag stack increases.

3. Bag stacking apparatus comprising in combination a receiver for the bags, delivery means for delivering bags to the receiver, a plate at the stacking station and overlying the bags being stacked, and driven means for raising said plate in relation to the bottom of the receiving means and relatively to the delivery means as the stack is built up.

4. Bag stacking apparatus comprising in combination a receiver for the bags, delivery means for delivering bags to said receiver, said receiver having a bottom, a plate adjacent the further end of the receiver bottom and lying above the bags being stacked, and driving mechanism for gradually elevating said plate relatively to the delivery means in timed relation to the building up of the stack.

5. Bag stacking apparatus comprising in combination a receiver for the bags, delivery means for delivering bags to said receiver, said receiver having a bottom, a plate extending transversely of the bags being stacked and lying above the stack, and driving mechanism for gradually elevating said plate relatively to the delivery means to maintain the same in approximately the same position relatively to the bags at all times.

6. Bag stacking apparatus comprising in combination a receiver for the bags provided with a bottom, a pivoted member extending from the entry end of the receiver to a point adjacent the further end of the receiver bottom, a plate carried by said pivoted member and extending transversely thereto across and overlying the bag stack, and a cam for moving said member on its pivot to raise the plate in timed relation to the building up of the stack of bags.

7. Bag stacking apparatus comprising in combination a bag receiver having a bottom, a pivoted bar adjacent one side of the receiver and extending from the entry end to a point adjacent the further end of the receiver bottom, a plate carried by the free end of said bar and extending transversely of the bar so as to overlie the bag stack at the further end of the receiver bottom, delivery means for delivering bags in succession to the receiver, bag guiding means rigid with the pivot end of said bar for directing bags to the receiver, and means for elevating said guiding means and said plate in timed relation to the building up of the bag stack.

8. Bag stacking apparatus comprising in combination a receiver having a bottom, bag guiding means adjacent the entry end of the receiver for guiding bags thereinto, a plate overlying the bag stack, means for elevating said guiding means and said plate in timed relation to the building up of the stack, stack shifting arms, a bar from which said arms are suspended, a cam for raising said arms, actuating means for the arms to effect a side motion thereof to bring the arms into engagement with the far side of the bag stack, and means operating in timed relation with the stacking operation for effecting a return of the arms to their original position to shift the bag stack laterally out of the stacking station.

9. Bag stacking apparatus comprising in combination a receiver for the bags, a pivoted member having its end remote from the entry end of the receiver overlying the receiver bottom, and spaced therefrom to permit of the entry of bags between the receiver bottom and said pivoted member, and a driven cam mechanism for gradually elevating the said remote end of said pivoted member in timed relation with the entry of bags to the receiver, while maintaining the end of said member in contact with the bag stack.

This specification signed this 28 day of Nov., 1930.

PAUL HUNZIKER.