Jan. 3, 1928. 1,654,706

O. A. SCHOEN

PACKING MACHINE

Filed May 20, 1927 4 Sheets-Sheet 1

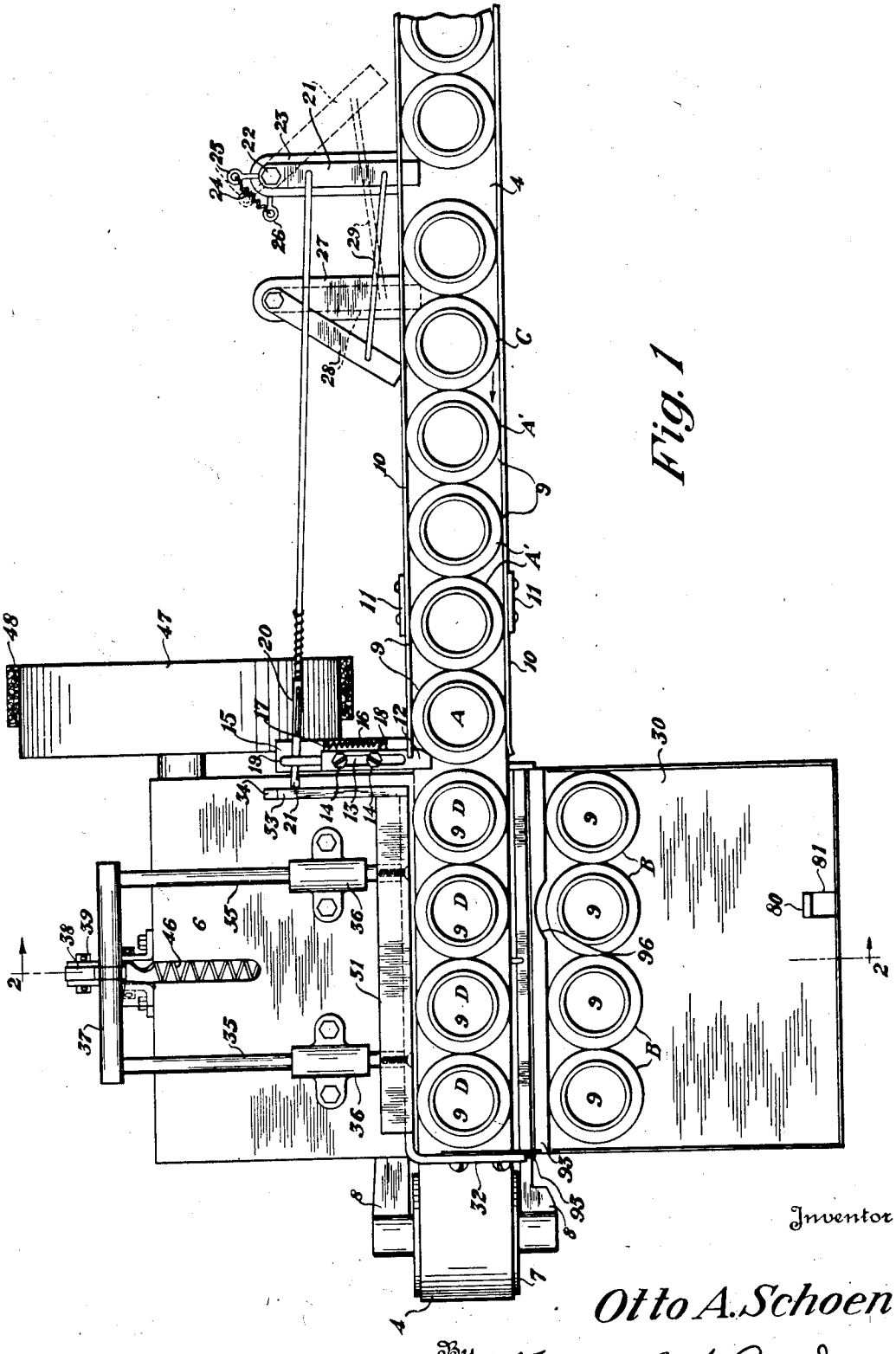


Fig. 1

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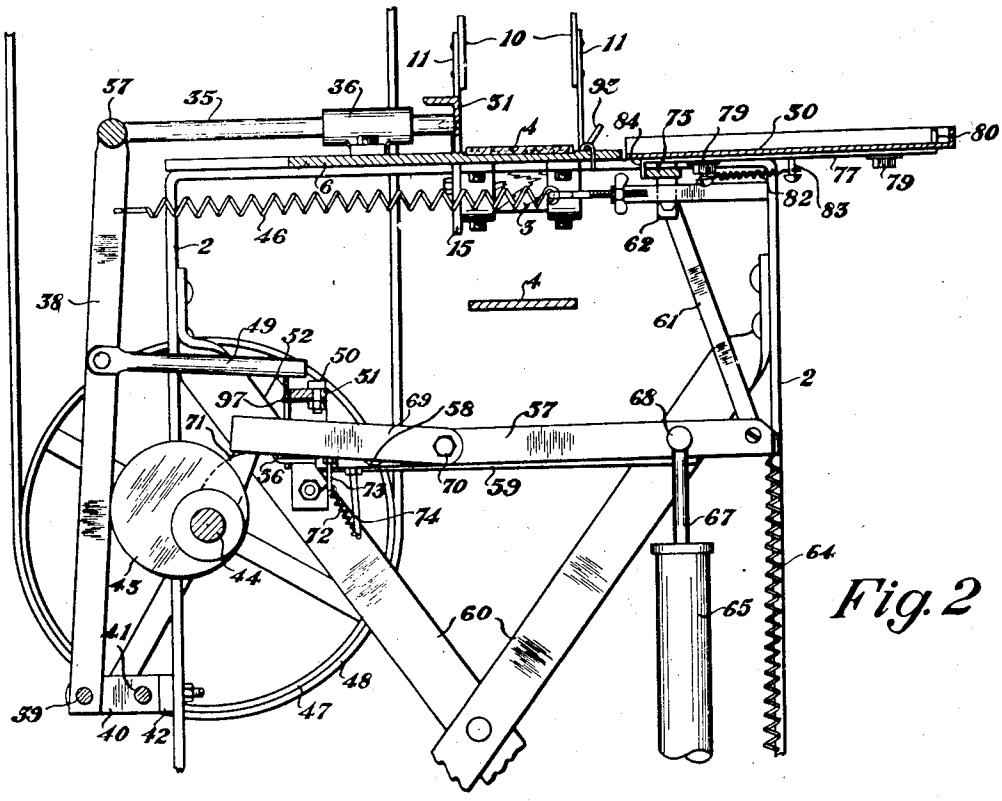


Fig. 2

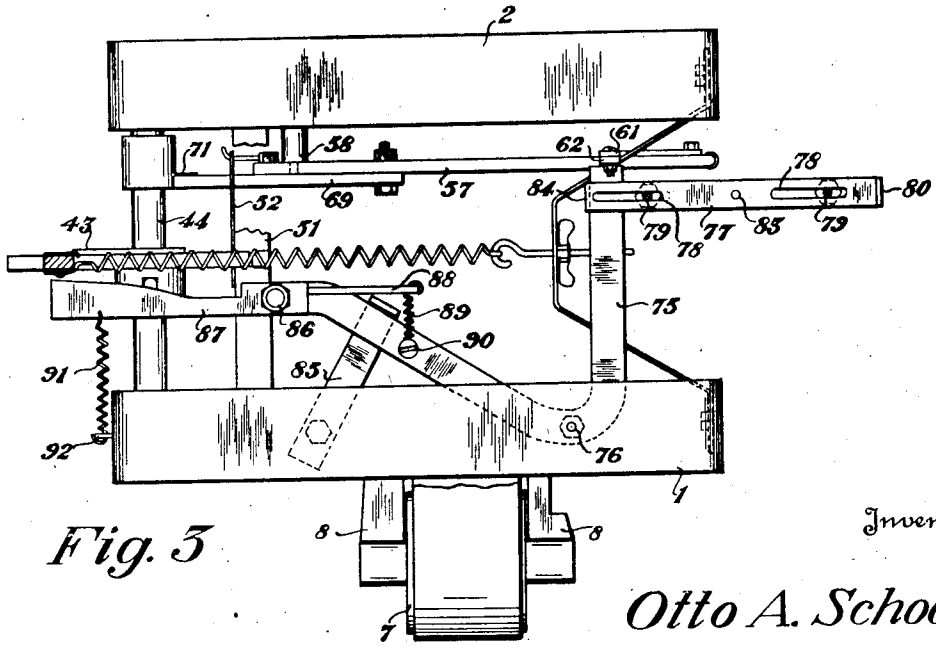


Fig. 3

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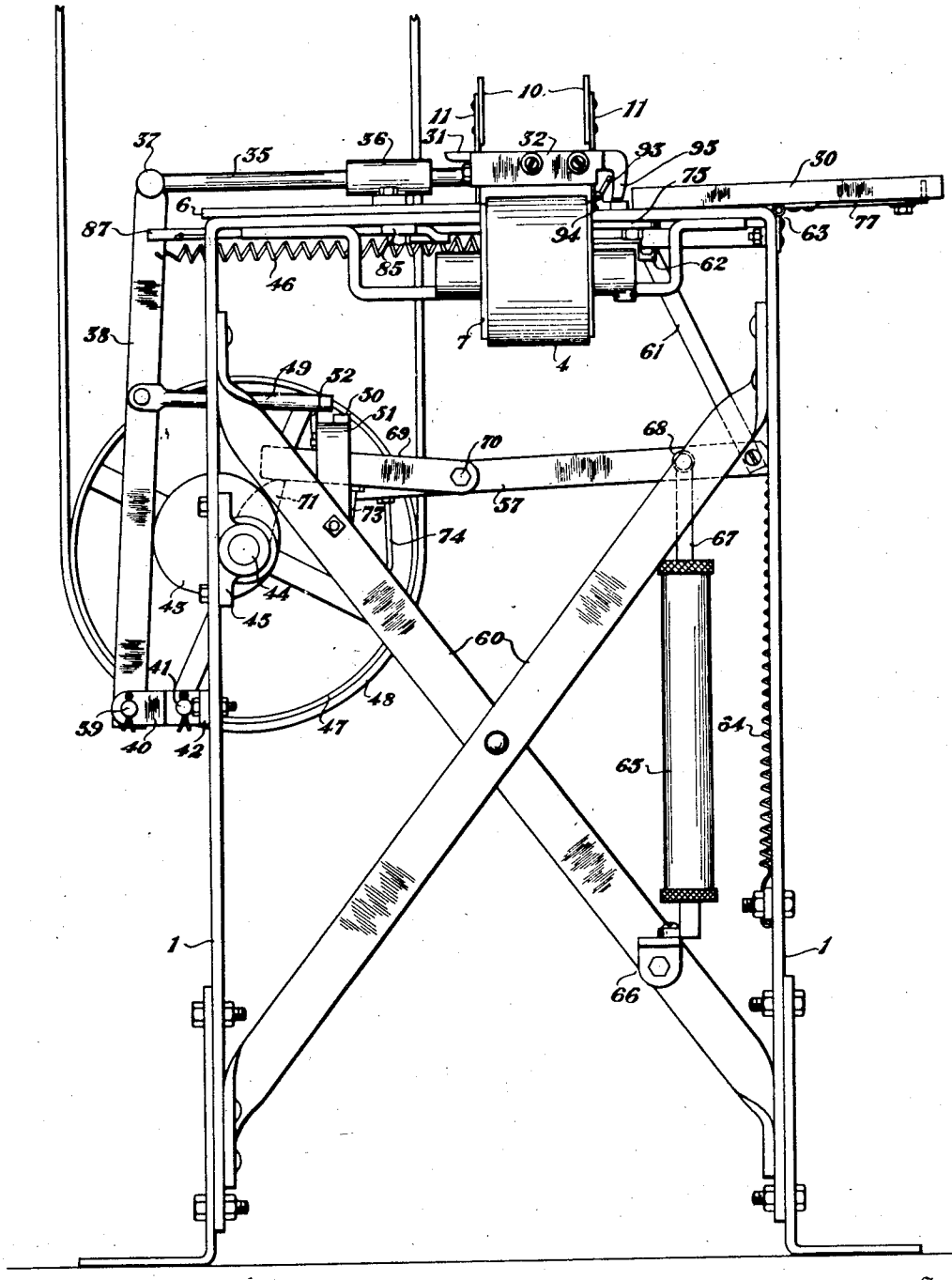


Fig. 4

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4 Sheets-Sheet 4

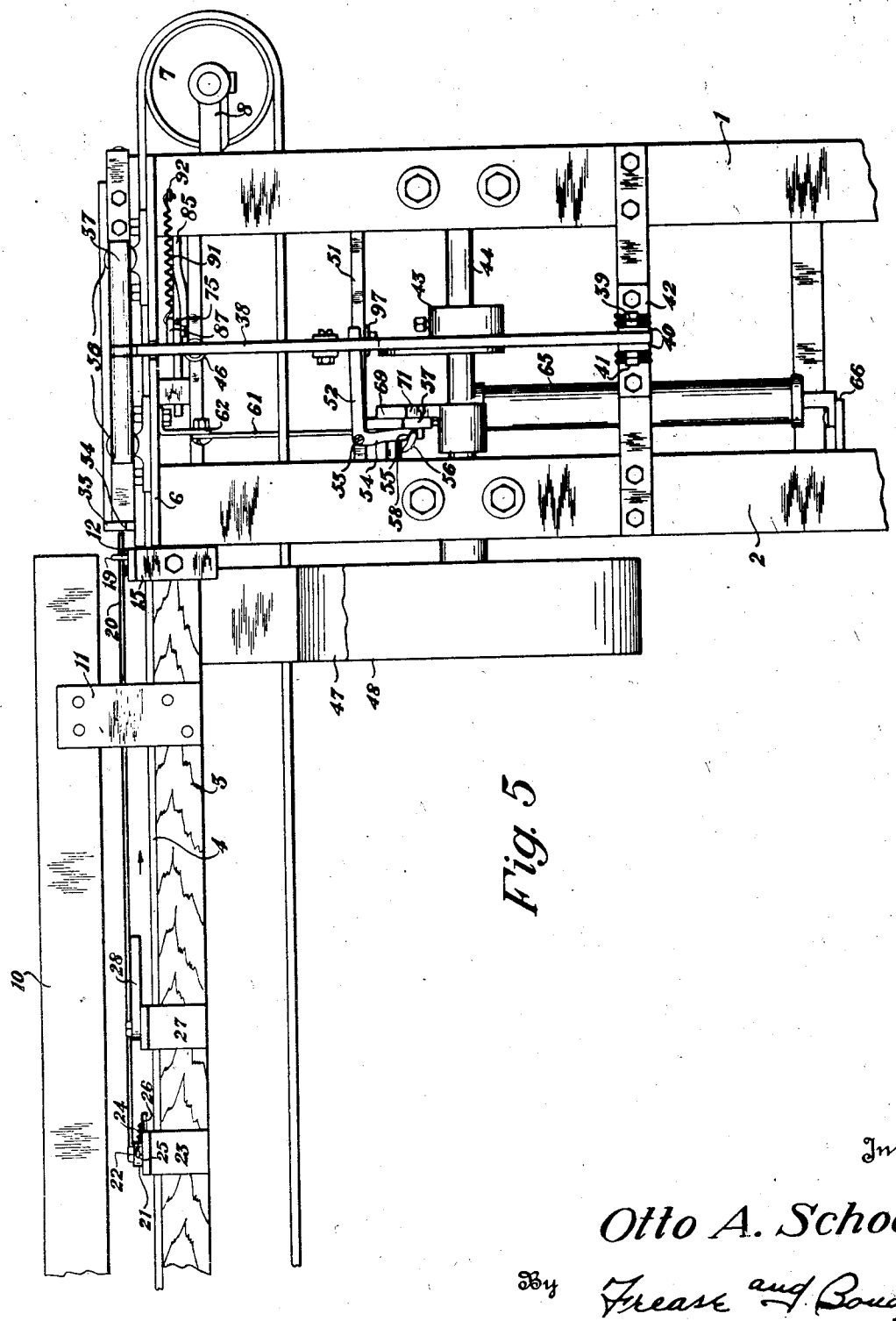


Fig. 5

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UNITED STATES PATENT OFFICE.

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PACKING MACHINE.

Application filed May 20, 1927. Serial No. 192,906.

The invention relates to machines for packing cans, boxes and the like in position to be received within a carton and the object of the invention is to provide an apparatus which conveys the cans or other articles to be packed to a table, which may be tilted, to place the articles within the carton, automatic means being provided for successively placing upon the table rows containing a determined number of the cans or other articles, depending upon the size of the carton to be filled, means being provided for automatically stopping the feeding mechanism when the proper number of articles is placed upon the table.

An embodiment of the invention is illustrated in the accompanying drawings, in which

Figure 1 is a top plan view of the improved packing machine;

Fig. 2, a transverse section on the line 2—2, Fig. 1;

Fig. 3, a partial top plan view with the bed plate and table removed;

Fig. 4, an end elevation of the machine; and

Fig. 5, a rear elevation.

Similar numerals refer to similar parts throughout the drawings.

The mechanism may be supported upon a pair of spaced side frames 1 and 2, a bed 3 being supported at one end upon the frame 2 and supported in any suitable and well known manner at its opposite end.

An endless conveyer belt 4 is arranged to travel, in the direction of the arrow shown in Fig. 5, upon the top of the bed 3 and over the bed plate 6, which is carried by the frame members 1 and 2.

This belt passes around a pulley 7, journaled in bearing brackets 8 carried by the frame 1, and then passes back beneath the bed and over a similar pulley (not shown) at the entrance end of the machine. Either of these pulleys may be driven in any usual and well known manner.

The cans or boxes to be packed are indicated at 9 and are placed upon the conveyer belt 4 at the entrance end of the same and carried toward the opposite end thereof.

For the purpose of guiding the cans as they are carried upon the conveyer belt, side rails 10 may be located upon each side of the bed 3, being connected thereto as by the brackets 11.

A sliding stop bar 12 is provided at the end of the bed 3 to delay the feeding of the cans to the bed plate 6 until the required number of cans to form a complete row is in position.

In the form of the invention illustrated, twelve cans are adapted to be packed in a carton, three rows of four cans each being successively moved into position to be packed.

The sliding stop bar 12 is provided with the longitudinal slot 13 through which the spaced studs 14, carried by the bracket 15, are located.

A spring 16 is connected to a pin 17 at the outer end of the sliding stop bar and to a lug 18 upon the inner end portion of the bracket 15 to normally hold the stop bar in the position shown in Fig. 1, preventing movement of the can shown at A until the stop bar is released.

The outer end of the stop bar 12 is provided with a slotted eye 19 through which is located one end portion of a rod 20 having the hooked free end as shown at 21.

The opposite end of the rod 20 is pivotally connected to a pivoted releasing lever 21 which is pivotally mounted at its outer end, as at 22 upon a bracket 23 supported from one side of the bed 3, the inner free end of the lever being arranged to be projected into the path of the cans traveling upon the endless conveyer belt.

A spring 24 is connected to an eye 25 at the outer end of the lever 21 and to a similar eye 26 upon the bracket 23 for normally holding the lever 21 in the dotted line position shown in Fig. 1.

A bracket 27 is mounted upon the side of the bed 3 between the bracket 23 and the sliding stop bar 12 and has pivoted thereon a setting lever 28 adapted to set the releasing lever 21 in position for operation. These levers are connected together by a link 29.

The machine as illustrated is adapted to pack twelve cans in position for placement in the carton. This is accomplished by placing three rows of four cans each in position as will be later described.

As shown in Fig. 1, four cans are located upon the conveyer belt over the bed plate 6

and beyond the stop finger 12. Until these cans have been moved laterally, upon the tilting table 30, into the position of the row of cans indicated at B, the remaining cans upon the conveyer belt are held against movement by the sliding stop bar 12.

In order to move each row of four cans laterally from the conveyer belt onto the tilting table, a reciprocating frame 31 is provided having the angular outer end 32 and the rearwardly disposed arm 33 at its inner end, said arm having the reduced or notched extremity 34 adapted to be engaged by the hook 21 of the rod 20 as will be later described.

This frame is provided with a pair of spaced rearwardly extending guide rods 35 mounted for reciprocation through the bearings 36 upon the bed plate 6. These guide rods are connected together at their rear extremities by the bar 37, to the central portion of which is pivotally connected the upper end of a lever 38, fulcrumed at its lower end as at 39 upon a link 40 pivotally connected as at 41 to a brace bar 42 mounted upon the side frames 1 and 2.

A cam 43 is fixed upon the shaft 44, journaled in bearings 45 carried by the side frames. The lever 38 is normally held in contact with the periphery of the cam by means of a spring 46.

A pulley 47 is mounted upon the cam shaft 44 and may be driven from any suitable source of power as by the belt 48. As the cam shaft is thus continuously rotated the reciprocating frame 31 will normally be continuously reciprocated.

For the purpose of stopping reciprocation of the reciprocating frame when the tilting table 30 has been filled with cans, a stop finger 49 is provided upon the lever 38 for engagement with the stop lug 50 upon the cross bar 51. This stop finger 49 is normally held out of engagement with the stop lug 50 by means of the bell crank 52 pivoted as at 53 upon the cross bar 51.

The depending arm 54 of the bell crank lever is provided with the inclined lower end 55 arranged to be normally engaged by the curved pin 56 carried by the lever 57. This lever is pivoted near its inner end as at 58 to a bar 59 connected to the cross braces 60 of the side frame 2. The outer end of this lever is connected to a link 61 pivotally connected to a depending post 62 upon the inner end portion of the tilting table 30.

This table is hinged to the side frames 1 and 2, substantially at its longitudinal center as indicated at 63 and arranged to be normally held in horizontal position by the spring 64 connected to the outer end of the lever 57 and to the lower portion of one of the legs of the side frame 2.

An air cylinder 65 may be pivotally connected at its lower end to one of the cross pieces 60, as indicated at 66, the piston 67 thereof being pivotally connected to the lever 57 as shown at 68 in order to cushion the downward movement of the lever 57.

A short lever 69 is pivoted at its outer end to the inner portion of the lever 57 as shown at 70. This lever is normally held down in engagement with the cam 71, upon the cam shaft 44, by means of the spring 72 which is connected to a pin 73 upon the under side of the lever 69 and to an elongated pin 74 depending from the inner end of the lever 57.

The stop mechanism above described is designed for holding the reciprocating frame against movement during the time the table 30 is tilted to remove the filled carton. For the purpose of automatically stopping the movement of the reciprocating frame as soon as the proper number of cans, to fill a carton, are placed upon the tilting table, a stop mechanism is provided comprising a bent lever 75 pivoted intermediate its ends, as at 76 to the side frame 1 and adapted to be rocked by means of the sliding bar 77 mounted for reciprocation beneath the tilting table 30. This bar may be provided with the elongated slots 78 which receive the bolts 79 protruding from the under side of the tilting table.

The outer end of the bar 77 is upturned as shown at 80 and extends through a notch 81 in the outer edge of the tilting table. A spring 82 is connected to a pin 83, located intermediate the ends of the bar 77 and to the rearmost bolt 79 for normally holding the bar in the inoperative position, as illustrated in the drawings.

The inner end of the bar 77 is downturned as shown at 84 and hooked over the end portion of the bent lever 75, whereby an outward pull upon the bar 77 will rock the lever 75 upon its pivotal point 76.

The inner end portion of the lever 75 may be slidably supported upon the supporting bar 85, and pivotally mounted upon the inner extremity of said lever as at 86 is the stop lever 87.

An elongated pin 88 is connected to the inner end of the stop lever and a pull spring 89 is connected to the extremity of said pin and to the lever 75 as shown at 90.

A pull spring 91 is connected to the outer end portion of the lever 87 at one end, the other extremity of the spring being connected to the side frame 1 as shown at 92, tending to normally hold the lever 87 in the position shown in Fig. 3.

With the parts in the normal position, as shown in Fig. 3, it will be seen that the stop lever 87 is normally held out of the path of the rock lever 38 which operates the reciprocating frame 31, and the pivoted stop finger 49 upon said lever is held above the

stop lug 50 by means of the bell crank 52, thus permitting the reciprocating frame to be continuously operated under normal conditions.

A guide bar 93 is hinged as at 94 upon the bed plate 6 and arranged to be normally held in raised position by means of the hook 95 upon the angular end portion 32 of the reciprocating frame.

Thus, when the reciprocating frame is in the rearward position, the guide bar 93 is held in raised position, guiding the cans as they are moved over the bed plate.

A notch 96 may be formed in the free edge of the guide bar 93, at a point opposite to the upturned end 80 of the sliding bar 77 for a purpose hereinafter described.

In the operation of the apparatus, the cans, or other articles to be packed, are moved upon the conveyer belt 4 in the direction of the arrow shown in Fig. 1. The sliding stop bar 12 is in the position shown in this figure and the first can is stopped by the same in the position shown at A.

The next three cans to pass along the belt will be stopped by the can A in the positions shown at A'. The fifth can, shown at C, will engage the setting lever 28 and move it from the dotted line position to the full line position shown in Fig. 1.

This movement of the setting lever will, through the link 29, move the releasing lever 21 from the dotted line to the full line position, permitting the next can following upon the conveyer to engage the releasing lever and move the same still further, sliding the rod 20 through the loop 19 and moving the hook 21 into the path of the angular notched end 34 of the reciprocating frame.

Upon the next rearward movement of the reciprocating frame, the hooked end 21 of the rod 20 is engaged by the notched end of the frame and the sliding stop bar 12 is pulled rearward out of the path of the cans.

The four cans shown at A and A' are then moved over the bed plate into the position shown at D.

Upon the next forward movement of the reciprocating frame 31, these four cans are moved laterally into the position shown at B, being deposited upon the tilting table 30.

This operation is continued until three rows of four cans have been placed upon the tilting table, each succeeding row of cans pushing the next preceding row forward upon the table.

As the third row of cans is moved upon the table, the second can from the right in the first row will engage the upturned end 80 of the sliding bar 77, sliding the bar forward and rocking the lever 75 upon its pivot 76, carrying the stop lever 87 across the path of the rock lever 38.

The notch 96 is provided in the guide bar 93 to permit the adjacent can in the third row to be seated squarely upon the tilting table.

The operation of the reciprocating frame is thus stopped, with the frame in the rearward position. A carton is then placed, in inverted position, over the twelve cans upon the tilting table and the table tilted forwardly to permit the carton, with the cans therein, to be removed right side up.

As the table 30 is tilted, the link 61 will pull the lever 57 upward at its forward end, moving the curved pin 56 down out of engagement with the beveled lower end of the arm 54 upon the bell crank 52.

The bell crank is thus permitted to drop into engagement with the stop plate 97, lowering the pivoted finger 49, upon the rock lever 38, permitting the same to engage the stop lug 50.

The reciprocating frame thus continues to be held against movement during the time that the table 30 is tilted. When the tilting table is moved back to the normal position, the lever 57 is brought back almost to the normal position and as the cam 71 engages the lever 69, the pull upon the spring 72 is sufficient to bring the lever 57 back entirely into the normal position, moving the curved pin 56 back into engagement with the lower beveled end of the bell crank 52, raising the same and moving the pivoted finger 49 out of engagement with the stop lug 50, permitting the reciprocating rack to again continue its regular reciprocation as above described.

I claim:—

1. A packing machine including a table, a conveyer for moving articles to be packed to a point adjacent to the table, a reciprocating frame for moving the articles from the conveyer onto the table, and means for automatically stopping the reciprocating frame when a predetermined number of articles has been placed upon the table.

2. A packing machine including a table, a conveyer for moving articles to be packed to a point adjacent to the table, a reciprocating frame for moving the articles from the conveyer onto the table, and means operated by the placing of the articles upon the table for automatically stopping the reciprocating frame when a predetermined number of articles has been placed upon the table.

3. A packing machine including a table, a conveyer for moving articles to be packed to a point adjacent to the table, a reciprocating frame for moving a predetermined number of articles at a time from the conveyer onto the table and means for stopping the reciprocating frame when a predetermined number of articles has been placed upon the table.

4. A packing machine including a table, a conveyer for moving articles to be packed to a point adjacent to the table, a reciprocating frame for moving a predetermined number

of articles at a time from the conveyer onto the table and means operated by the placing of the articles upon the table for stopping the reciprocating frame when a predetermined number of articles has been placed upon the table.

5. A packing machine including a tilting table, a conveyer for moving articles to be packed to a point adjacent to the table, a reciprocating frame for moving the articles from the conveyer onto the table, and means controlled by the tilting of the table for stopping the reciprocation of the frame.

6. A packing machine including a tilting table, a conveyer for moving articles to be packed to a point adjacent to the table, a reciprocating frame for moving the articles from the conveyer onto the table, a continuously rotating cam for reciprocating said frame, and means controlled by the tilting of the table for holding the frame out of contact with the cam.

7. A packing machine including a table, a conveyer for moving articles to be packed to a point adjacent to the table, a reciprocating frame for moving the articles from the conveyer onto the table, a continuously rotating cam for reciprocating said frame, and means for automatically holding the frame out of contact with the cam when a predetermined number of articles has been placed upon the table.

8. A packing machine including a table, a conveyer for moving articles to be packed to a point adjacent to the table, a reciprocating frame for moving the articles from the conveyer onto the table, a continuously rotating cam for reciprocating said frame, and means operated by the placing of the articles upon the table for automatically holding the frame out of contact with the cam when a predetermined number of articles has been placed upon the table.

9. A packing machine including a table, a conveyer for moving articles to be packed to a point adjacent to the table, a stop for normally holding the articles away from said point, a reciprocating frame for moving the articles from the conveyer onto the table, and means controlled by the movement of the articles upon the conveyer for operatively connecting the stop to the reciprocating frame for operating the stop to release a predetermined number of articles at a time.

10. A packing machine including a tilting table, a conveyer for moving articles to be packed to a point adjacent to the table, a reciprocating frame for moving the articles from said point onto the table, means operated by the placing of the articles upon the table for stopping the reciprocating frame when a predetermined number of articles has been placed upon the table, and means operated by the tilting of the table for holding the frame against movement.

In testimony that I claim the above, I have hereunto subscribed my name.

OTTO A. SCHOEN.