

Aug. 19, 1924.

1,505,595

A. W. HILSINGER
STACKING AND COUNTING MACHINE

Filed June 18, 1921

5 Sheets-Sheet 1

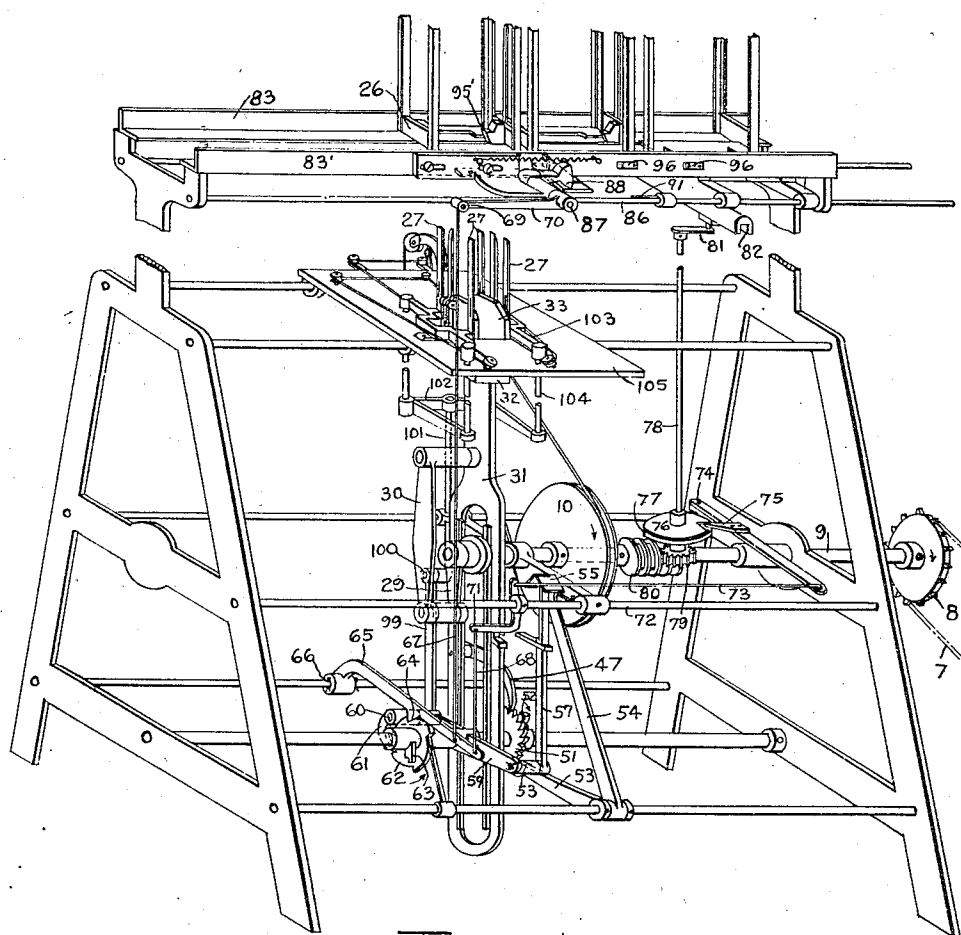


Fig. 1

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By his Attorney

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5 Sheets-Sheet 2

1,505,595

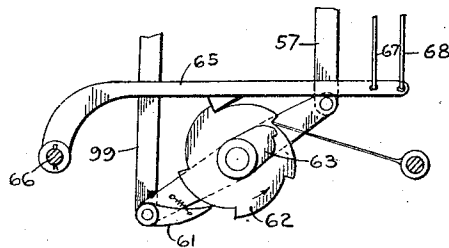


Fig-13

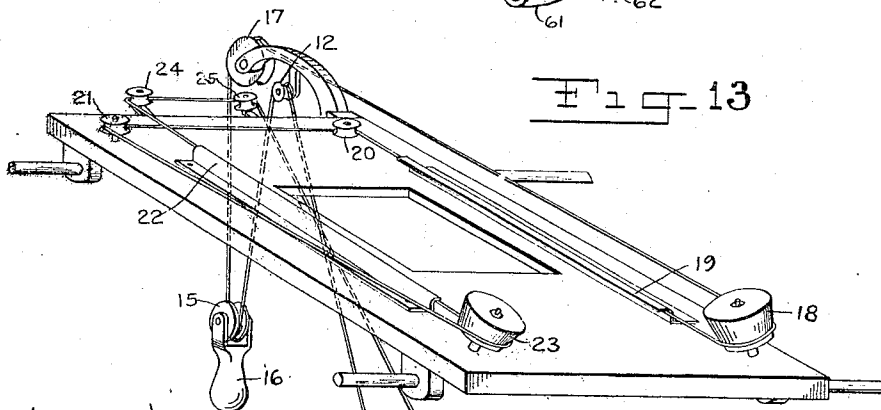
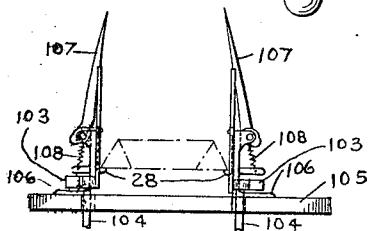


Fig-14

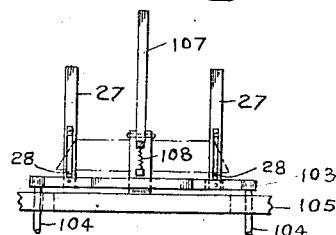


Fig-15

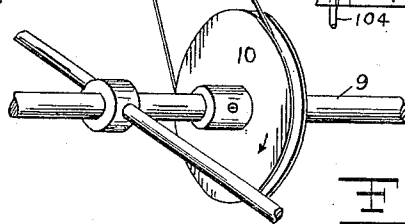


Fig-2

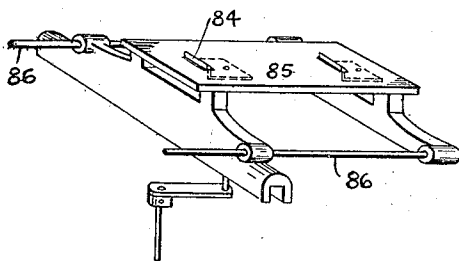


Fig-16

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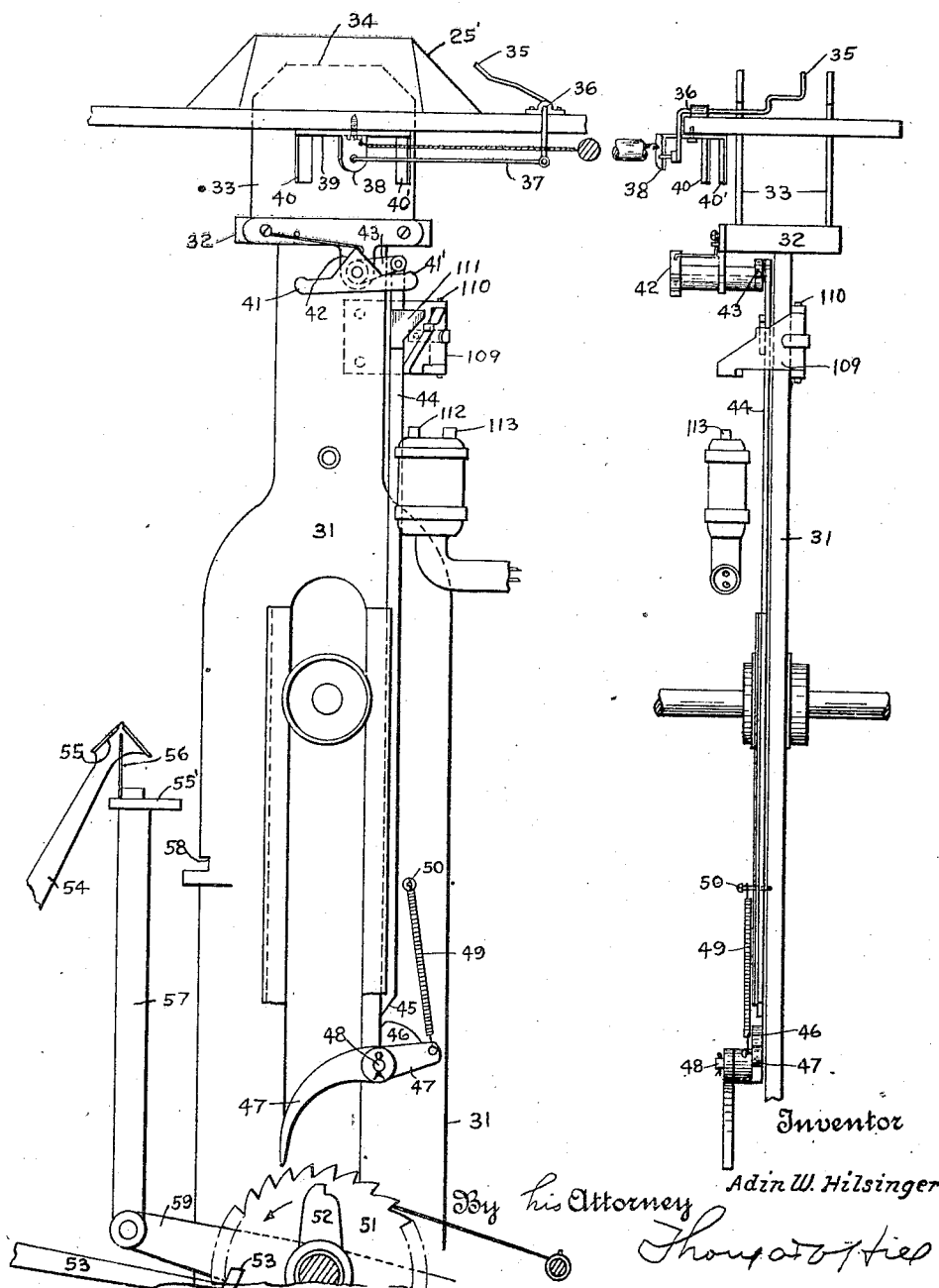
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Fig-3

Fig-4



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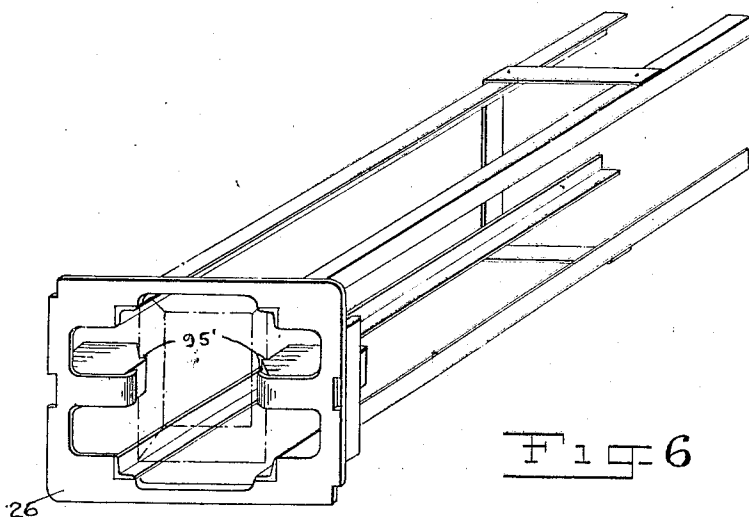
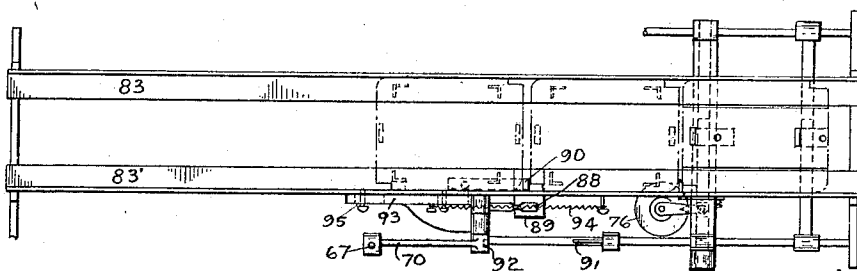
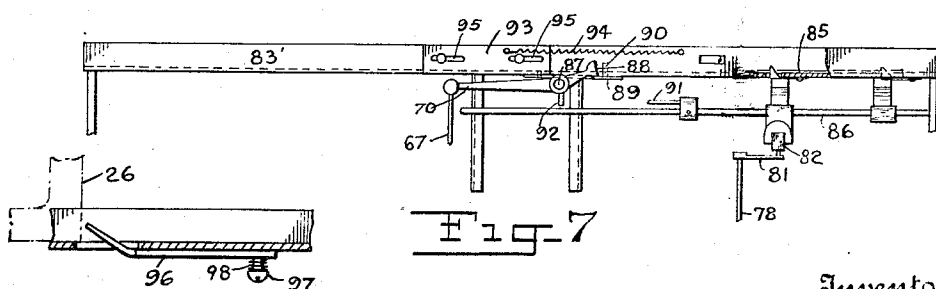
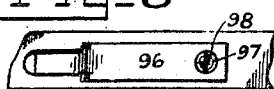


Fig-8



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STACKING AND COUNTING MACHINE

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5 Sheets-Sheet 5

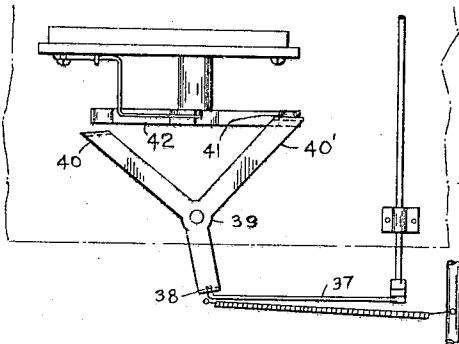


Fig-10

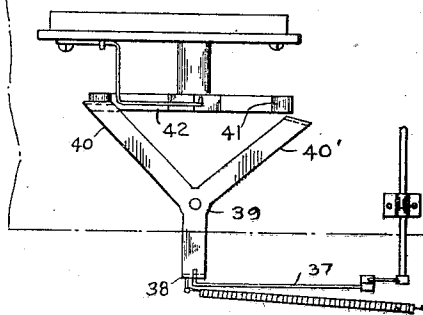


Fig-11

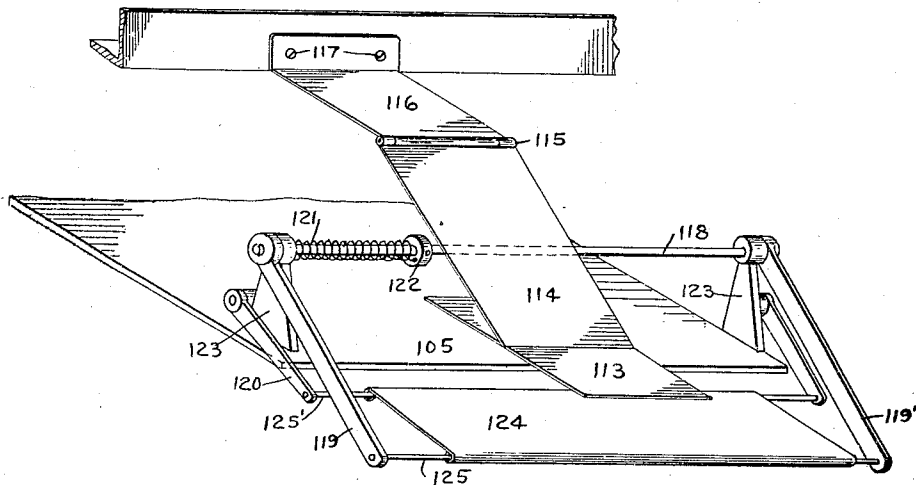


Fig-12

Inventor

Adin W. Hilsinger

By his Attorney

Thompson

UNITED STATES PATENT OFFICE.

ADIN W. HILSINGER, OF ORANGE, NEW JERSEY, ASSIGNOR TO HENRY BRADY, INC., A CORPORATION OF NEW JERSEY.

STACKING AND COUNTING MACHINE.

Application filed June 18, 1921. Serial No. 478,538.

To all whom it may concern:

Be it known that I, ADIN W. HILSINGER, a citizen of the United States, residing at Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Stacking and Counting Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in stacking and counting attachments adapted more particularly for use in combination with a paper tray making machine such as illustrated and described in co-pending patent application of Brady and Hilsinger, Ser. No. 184,202.

Referring to the accompanying drawings, I have illustrated in Fig. 1 in perspective, an attachment embodying an application of my invention. Fig. 2, is a detail in perspective, parts being broken away, illustrating part of the feeding mechanism. Fig. 3, is another detail of the same. Fig. 4, is a view looking from right to left at Fig. 3. Fig. 5, is a plan view showing part of the mechanism for shifting the racks for the trays. Fig. 6, is an enlarged detail in perspective of a rack or stacking frame attachment. Fig. 7, is a view looking upwardly at Fig. 5. Fig. 8, is an enlarged cross-sectional detail of a stack retaining mechanism, and Fig. 9, is a view looking upwardly at the same. Fig. 10, is a view looking down upon the three-legged counter device shown in Figs. 3 and 4, and Fig. 11, is another view of the same in its shifted position. Fig. 12, is a perspective view, parts broken away illustrating part of a box guiding mechanism. Fig. 13, is an enlarged detail of part of the counting mechanism. Fig. 14, is a front elevation showing part of the stacked box retaining mechanism, and Fig. 15, a view at right angles thereto. Fig. 16, is a detail of the stack shifting mechanism in perspective.

Referring now more particularly to Fig. 1, it will be observed that the attachment may be driven by belt or sprocket chain such as 7, adapted to engage sprocket wheel 8, upon the shaft 9, upon which is also secured the grooved pulley 10. By reference now more particularly to Fig. 2, it will be observed that this grooved pulley is provided with a rope or strap drive 11, which passes upwardly from the same over the pulley 12

and beneath the pulley 15, having counterweight 16, over the pulley 17, pulley 18, and beneath guide 19, around pulley 20, pulley 21, and around pulley 23, beneath the guide 22, over pulley 24, pulley 25, and around the grooved pulley 10, originally referred to, from which it will be seen that the rope or strap moves forwardly and substantially parallel to engage by friction the sides of the tray or box such as 25' which finally reaches the position within the rack or frame 26, shown in Fig. 6, the upwardly projecting standards 27 of which are provided with suitable light springs such as 28, shown to advantage in Figs. 14 and 15.

Referring now again to Fig. 1, it will be observed that at the inner end of the shaft 9 there is provided a crank 29, carrying the connecting rod 30, pivotally mounted upon the vertically slotted plunger 31, at the top of which is provided a platform 32 (see Fig. 3), carrying guides 33, engaging beneath the box 25' as shown in dotted outline at 34. This serves to raise the box beyond the spring retaining device 28, shown to advantage in Figs. 14 and 15, by which the boxes are held beneath the bottom of the stack. As each box is lifted, the end of the same striking the lever 35, pivoted at 36, throws the lower end of said lever leftwardly looking at Fig. 3, and being connected by rod 37 to the leg 38, of the three-legged member 39, shown to better advantage in Figs. 10 and 11, the leg 40 of said member is brought in the path of the projection 41 of the centrally pivoted lever 42, upon the same axis with which is also mounted the lever 43, pivotally connected to the rod 44, the lower end of which is of wedge-shape formation as shown at 45, and is adapted to operate the cam 46 of the pawl 47, pivoted at 48 and retained by spring 49 which is secured at 50 as shown, so that with each descent of the vertically slotted member 31, providing the pawl 47 has not been operated by the wedge member 45, the pawl 47 pivotally mounted upon the same and traveling with it, engages a tooth in the ratchet wheel 51, thereby rotating it leftwardly one tooth. In case a box is not lifted so as to strike the lever 35, the leg 40' being in the path of the lever 41', strikes lever 41', thereby depressing the rod 44 which causes the wedge-shape end thereof 45 to engage the cam 46, thereby lifting the pawl 110

47 clear of the pinion 51, with the result that no count is made. At the same time, the tapered member 111, moving in the path of the hinged member 109, swings the member 109 in the path of the button 113 thereby cutting off the current and stopping the machine.

The ratchet wheel 51 may be provided with say twenty-five teeth, and is also preferably provided with a member 52 which travels therewith, and which in its travel encounters the end of the lever 53, which is thereby pressed downwardly once each time twenty-five boxes have been pushed up by the machine as aforesaid. As the rod 53 is pushed down, it carries with it the rod 54, which may be formed therewith, and at the top of which it will be observed by reference to Fig. 3, a sort of cap 55 is provided, beneath which projects a suitable resilient member 56, from the top of the lever 57, so that as the vertically slotted member 31 rises, and the rod 57 is thrown rightwardly looking at Fig. 3, the engagement member 55' thereof becomes seated and locked within the recess 58 of said slotted member.

At the lower end of the rod 57 is pivotally mounted a rocking arm 59, which is also pivotally mounted at the axis of the ratchet wheel 62, and at the opposite end of the rocking arm 59 is secured the bearing 60 carrying the pawl 61, which engages the ratchet wheel 62, thereby rotating said ratchet wheel one tooth for each twenty-five boxes lifted above the machine.

After the ratchet wheel 62 has rotated once, which means in the illustration given, five teeth, one hundred and twenty-five boxes shall have been elevated in the stacker rack immediately above the slotted member 31, and then the projecting member 63, adjacent the ratchet 62, will be in a position to strike the enlargement 64, upon the arm 65 pivotally mounted at 66, and to which are connected the rods 67 and 68, the rod 67 being pivotally connected at the top at 69 to the lever 70, and the rod 68 being connected to the lever 71, pivoted upon the shaft 72, and being of L-shaped formation, thereby pushing the rod 73 connected thereto rightwardly, which said rod, being pivoted at 74, and having an engagement member 75, releases the upper disc 76 upon the shaft 78, from the lower disc 77 upon the pinion 79, which discs normally engage by friction as a clutch. The shaft 78, at its lower end, has the pinion 79, engaging the worm 80, upon the drive shaft 9, and the lever 81 at the opposite end thereof has its free end bearing 81 free to travel within the guide 82, which is part of the stack carriage shown in Fig. 16, and which is thereby reciprocated together with its stack along the guide 83 at the top of

the machine as shown, which in a few words means that every time one hundred and twenty-five boxes have been counted and stacked, that particular stack is shifted, out off position, and an empty stacking frame is replaced in position for a new stack of boxes.

Referring now again to Fig. 1, it will be observed that the angle guides 83—83' serve as a guide for the racks 26 shown in Fig. 6, the lower ends of which are engaged by the working member 84 (Fig. 16) upon the top of the table 85 of the stack carriage, said stack carriage being provided with bars 86 at opposite sides as guides for the same.

Referring now again to the rod 67, which is lifted each time one hundred and twenty-five boxes have been stacked and counted, the lever 70 which is elevated thereby, is pivotally mounted at 87 and a stop 88 is mounted at the opposite side and serves as an obstruction for the leftward movement of the stacks, looking at Fig. 1. When the lever 67 lifts, however, the stop 88 is of course depressed out of the path of the stack, and in moving downwardly carries with it the spring member 89, provided with a stop member 90, which is also depressed to clear the path of movement of the stack. As the stack moves leftwardly, the pin 91 traveling in the path of the lug 92, shifts the same, and also the member 93 against the action of the spring 94, the distance moved being allowed for by the slots 95. This allows the new stack to come into position, after which the stop member 88, having cleared the spring 89, is now free to be operated in the path of the next stack, after which the slide 93 returns to its normal position under influence of the springs 94. The entire column of one hundred and twenty-five boxes will therefore rest upon the ledges such as 95' in the base of the stack, and by inverting the stack, may be readily dumped out by gravity for packing or wrapping as may be required, thus providing a thoroughly automatic means for stacking and counting without interruption of the machine in any particular.

Also in the sides of the guides 83—83' are provided suitable resilient members 96, which project therethrough as shown in Figs. 8 and 9, to prevent the shifting back of the racks as they are moved forwardly, and these members may be mounted upon suitable screws such as 97, and may be provided with suitable springs, such as 98 if desired.

It will also be observed that each time the lever 57 is depressed, being connected to the rocker arm 59, the rod 99 connected at the opposite end is lifted, and being pivoted at 100 to the rod 101, lifts the same, together with the frame 102 at the top thereof, which said frame carries the frame

103 by the rods 104, extending through the table 105, the said frame 103 serving to lift each group of twenty-five boxes which are retained by the fingers 28 and clear the machine entering the stacking frames above, so as to leave clearance for the accumulation of the next twenty-five, and so on, and upon the table 105 may be provided suitable standards such as 106, for guides such as 107, which may be spring retained as indicated at 108, to control the stacking of the boxes before the same are pushed into the stacker frames.

Referring again to Figs. 3 and 4, it will be observed that a switch operating mechanism 109, is mounted upon the slotted vertically moving member 31, and is pivotally mounted as indicated at 110, so that it can be thrown out rightwardly by contact with the tapered member 111. The member 109, traveling with the slotted member 31, is controlled by the movement of the latter. Member 111 being operated by contact with the leg 40 controls the position of the tapered member 109 which being pivotally mounted is swung in the path of the button 112 which is depressed, the current being on. If the counter is not operating, however, the tapered member 111 advances to throw out the tapered member 109, and it therefore travels in the path of the button 113 which it strikes and cuts off the current, thereby instantly stopping the machine.

Referring now more particularly to Fig. 12, it will be observed that as the box approaches the counter and stacker mechanism, they are in a position to feed beneath the light metallic plate 113, which is formed with or may be secured to the plate 114, hinged at 115, to the plate 116, secured to the frame at 117. The bar 118 is provided with arms 119—119', said bar being pivotally secured in the standards 123. One end of a spring 121, is secured to the bar 118, by the sleeve 122, and the opposite end is secured to the standard 123, so that normally the weight of the arms 119—119', and the light metal deck 124, carried thereby is supported by said spring. The deck 124, is preferably pivotally secured to the bar 125' carried by pivoted arms 120 and also pivotally secured to the bar 125, said bar 125 being in turn preferably secured to the arms 119—119', so that with little effort the deck 124 may be depressed, but in doing so depresses substantially flat or horizontally, allowing a box caught or buckled thereupon, to escape beneath the platform 105.

Of course it will be understood that various modifications may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

I claim:

1. In an attachment of the class described

having a stacker, means for feeding containers beneath the stacker, means for successively shifting said containers vertically within said stacker, means for automatically shifting said stackers successively as a predetermined number of containers are stacked therein, and said means for feeding said containers comprising parallel moving friction engaging means.

2. In an attachment of the class described, a stacker and means for successively and automatically shifting said stackers as a predetermined number of containers are stacked in each of the same.

3. In a machine of the class described, means for lifting the boxes successively, stacking racks to receive the same, and means for automatically replacing a filled rack with an empty one each time a predetermined number of boxes have been stacked therein.

4. In a machine of the class described, means for lifting the boxes successively, stacking racks to receive the same, and means for automatically replacing a filled rack with an empty one each time a predetermined number of boxes have been stacked therein and means for holding the empty racks until a preceding rack has been filled.

5. In a machine of the class described, means for lifting the boxes successively, stacking racks to receive the same, and means for automatically replacing a filled rack with an empty one each time a predetermined number of boxes have been stacked therein and means for holding the empty racks until a preceding rack has been filled, and means for preventing the backward movement of said racks.

6. In a machine of the class described, a multi-sided stacking rack open entirely along one side except at the base.

7. In a machine of the class described, a shifting deck over which the boxes pass as they enter the stacker.

8. In a machine of the class described, a continuous belt feed for the boxes, and guides adjacent thereto for said belt.

9. In a machine of the class described, a single continuous belt feed for the boxes, and guides adjacent thereto for said belt said belt having parallel moving transverse portions, engaging said boxes.

10. In a machine of the class described, means for stacking and counting the boxes, and means for automatically discontinuing the operation of said stacker when said counting means becomes inoperative.

11. In a machine of the class described, means for lifting each box successively, means for thereafter lifting a predetermined number of said successively lifted boxes, and means for stacking and counting the same.

12. In a machine of the class described,

means for lifting each box successively, means for thereafter lifting a predetermined number of said successively lifted boxes, and means for stacking and counting the same and in combination therewith stackers for holding predetermined quantities of said boxes, and means for shifting said stackers into and out of position as the same are filled.

13. In a machine of the class described, a plunger for feeding the trays upwardly, means for feeding the trays laterally to said plunger, said plunger being adapted to serve as a stop for each succeeding tray as each preceding tray is stacked.

14. In a machine of the class described, a counting device for counting the trays formed and stacked, and automatic means for discontinuing the operation of said counting device whenever a tray fails to move upwardly into said stacker.

15. In a machine of the class described, a stacking frame having an open bottom and guides within which a predetermined number of trays may be vertically stacked.

16. In a machine of the class described, a stacking frame having an open bottom and guides within which a predetermined number of trays may be vertically stacked, and in combination therewith means for holding a predetermined number of trays therein above subsequent trays being stacked therein.

17. In a machine of the class described, stacks within which the trays when formed are secured, and means in combination with said stacks for removing a filled stack by an empty stack and placing said empty stack into position for receiving said trays.

18. In a machine of the class described, stacks within which the trays when formed are secured, and means in combination with said stacks for removing a filled stack by an empty stack and placing said empty stack into position for receiving said trays, and

means for retaining said stack in position for a further supply of trays when an empty stack is not in position to take the place of said stack being filled.

19. In a machine of the class described, means for vertically stacking trays as formed in predetermined quantities, and in combination therewith means for retaining stacks of said trays at opposite edges thereof.

20. In a machine of the class described, means for vertically stacking said trays as the same are formed, and in combination therewith resilient fingers for retaining said trays in their upwardly stacked position.

21. In a machine of the class described a continuous feeding belt for the trays as formed, said belt having portions moving parallel and in the same direction adapted to engage and feed said trays from opposite sides thereof.

22. In a machine of the class described, means for automatically vertically stacking and counting the trays in inverted position, one within the other.

23. In a machine of the class described, means for stacking boxes successively, and means at predetermined intervals for stacking previously stacked groups of said boxes.

24. In a machine of the class described, means for stacking boxes successively, and means at predetermined intervals for stacking previously stacked groups of said boxes, said means for stacking said groups controlled by said successive box stacking mechanism.

25. In a machine of the class described, means for stacking and counting boxes, and in combination therewith means for stacking groups of said boxes previously successively stacked.

In testimony whereof I hereunto affix my signature.

ADIN W. HILSINGER.