July 31, 1962 T. L. CARTER 3,046,712

CASE PACKER

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Fig. 1.

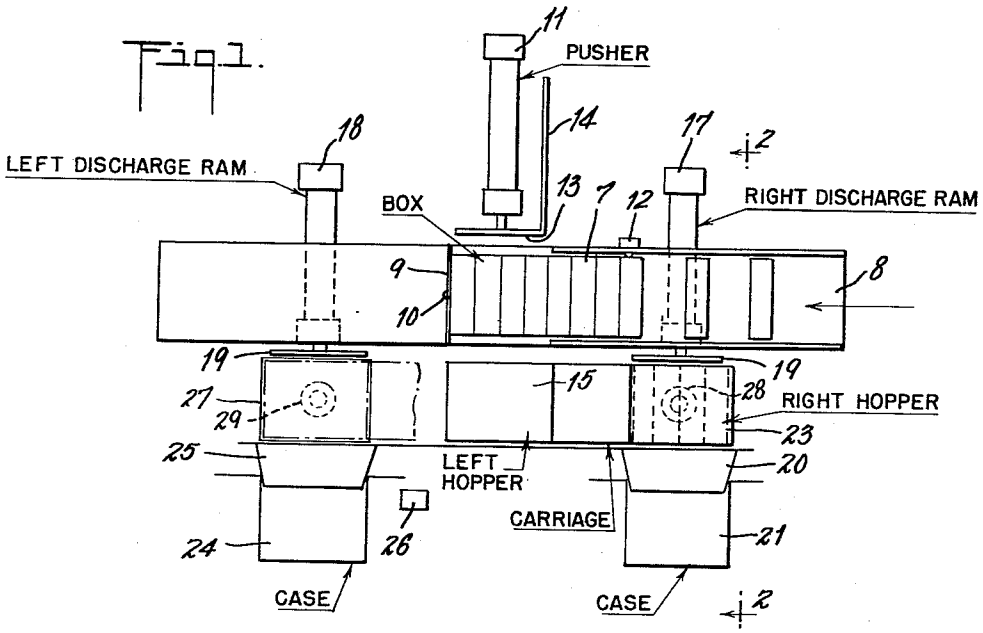
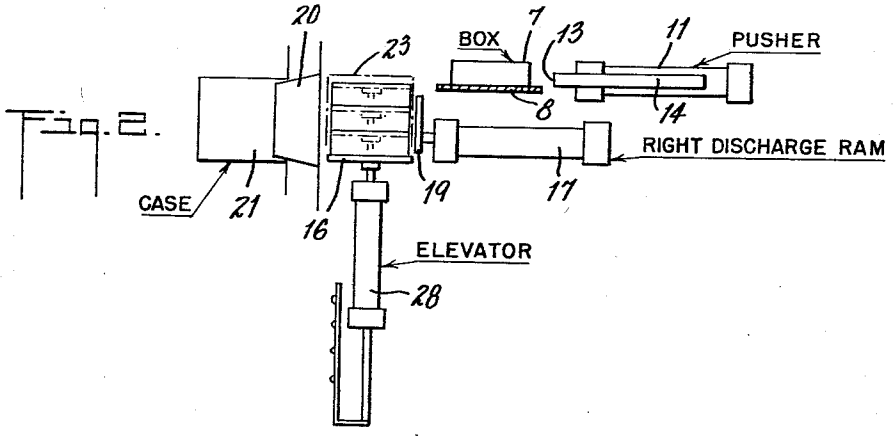


Fig. 2.



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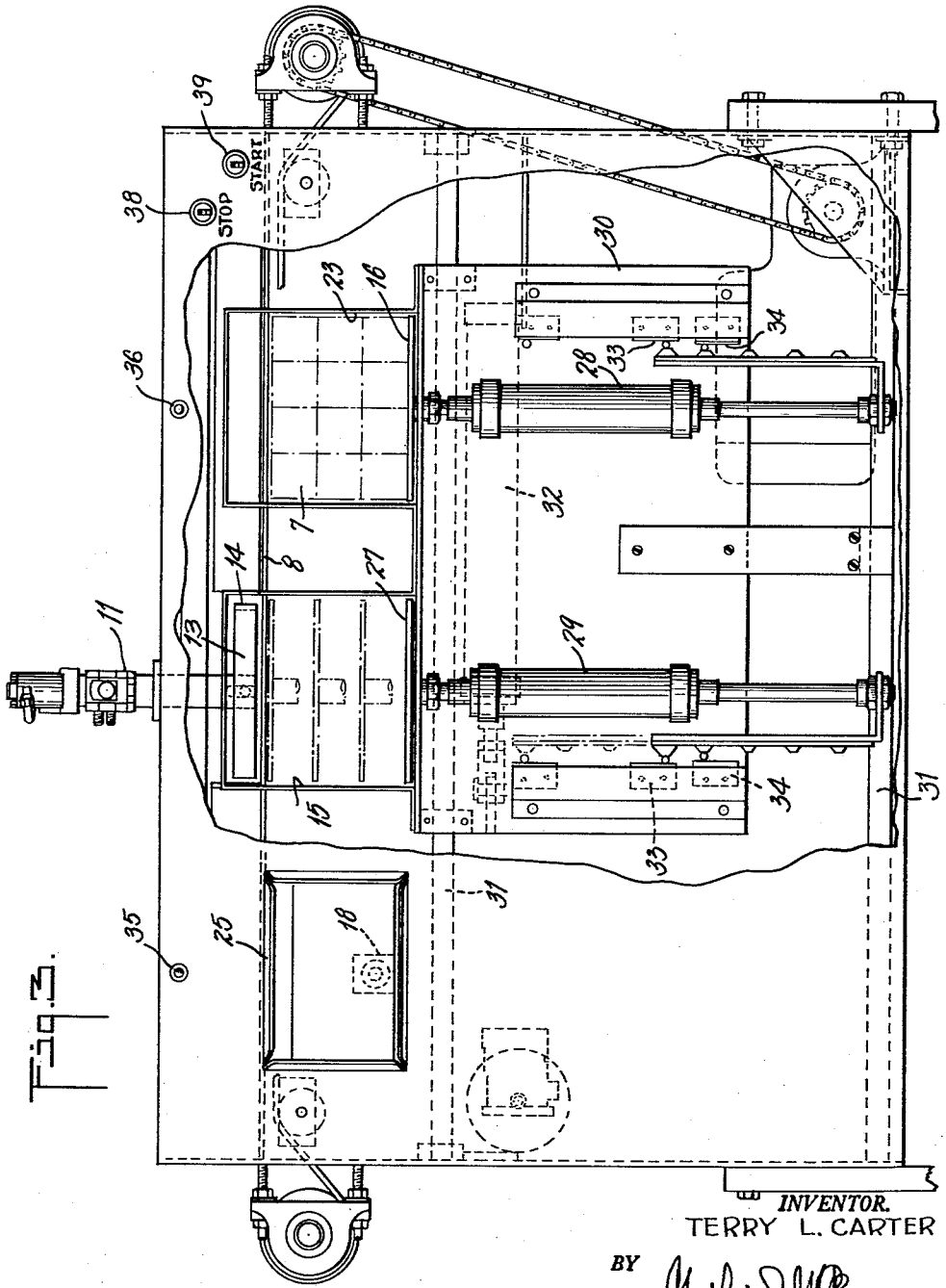


Fig. 3.

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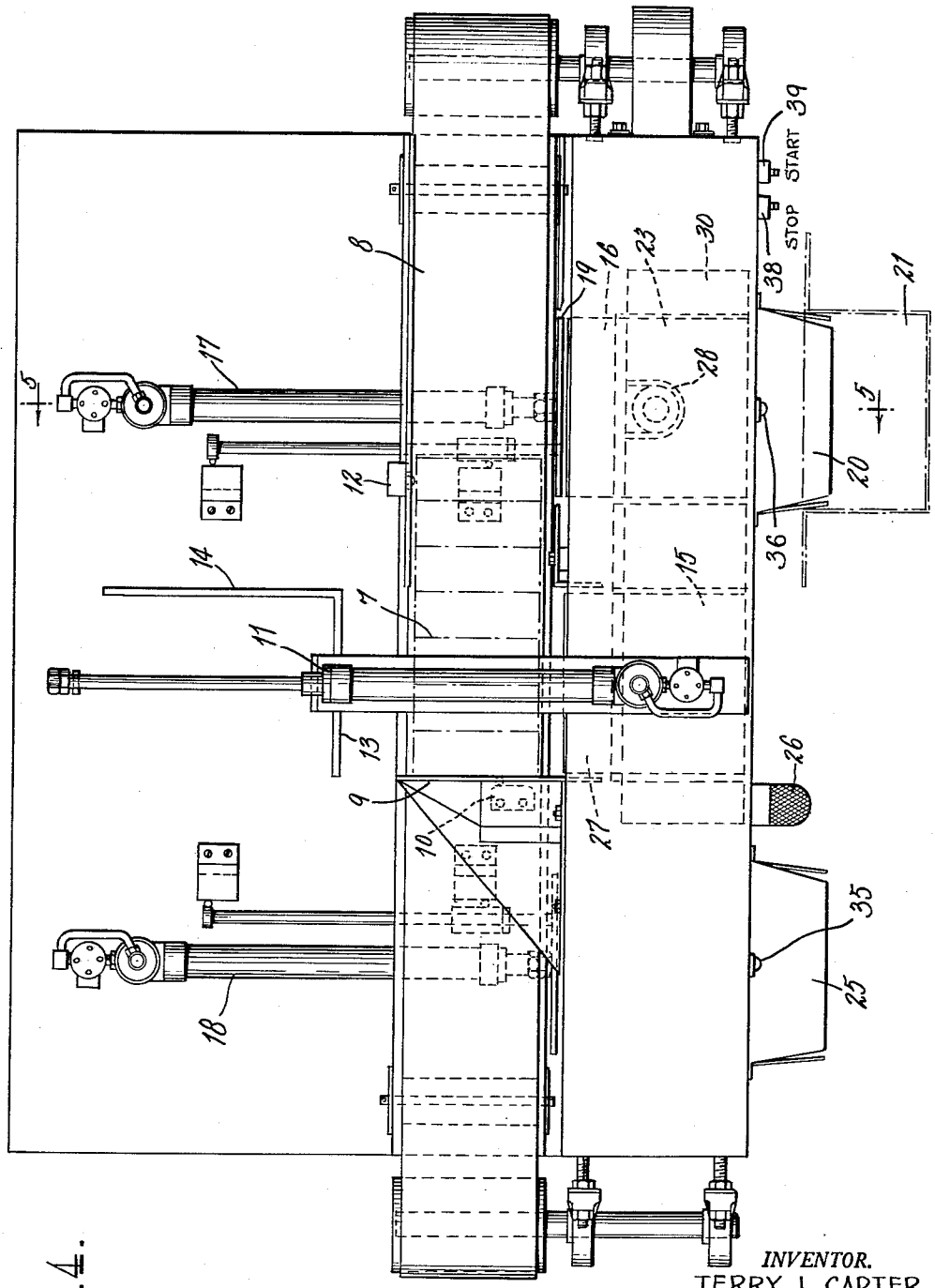


Fig. 4.

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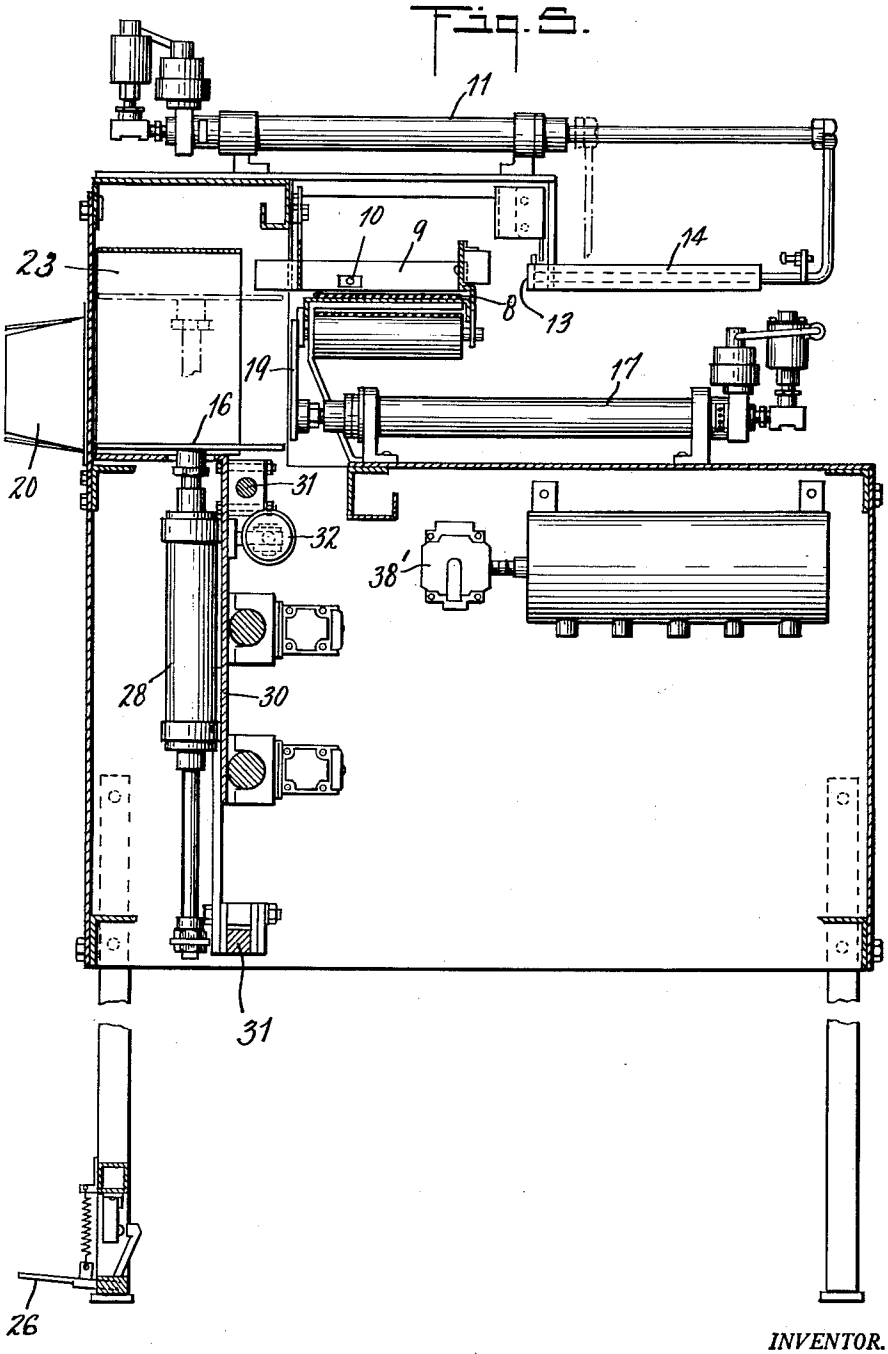
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CASE PACKER

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Fig. 5.



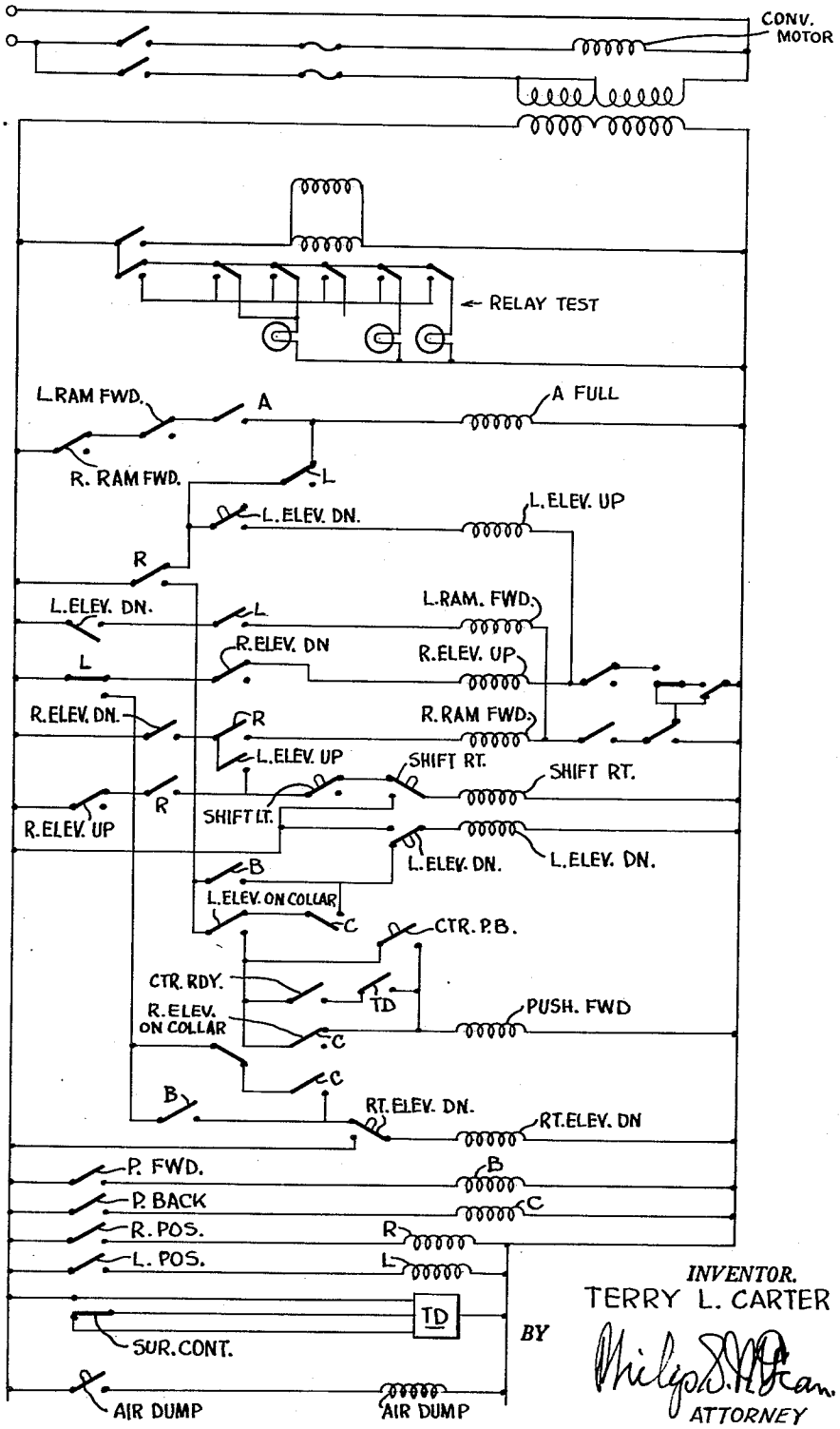
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Fig. 6.



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3,046,712

CASE PACKER

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Filed Nov. 2, 1960, Ser. No. 66,854
10 Claims. (Cl. 53—61)

The invention herein disclosed relates to the loading or packing of cases or cartons with boxes or packages containing such items as tubes, bottles, cans and the like.

Special objects of the invention are to provide a machine for the purpose which for what it accomplishes will be relatively simple in construction and operation and low in cost, which will be compact in form and occupy small space, be automatic and fast in its operation, be readily adaptable to handle different kinds and sizes of objects and which will be accurate and safe in its operation.

These and other desirable objects have been attained by a novel combination and arrangement of parts and involving a novel sequence of operations in which articles to be packed are assembled in layers and stacked layer on layer into a complete load at a central assembling station and shifted in complete load form into one of two receiving hoppers and the load discharged from the one hopper into a case or carton while the mechanism at the central station is assembling a fresh load for delivery to the other receiving hopper. In this manner assembly and packing is carried on substantially continuously without loss of time in shifting from one set of operations to another.

Other advantageous features and objects of the invention are set forth and will appear in the course of the following specification.

The drawings accompanying and forming part of this specification illustrate a present commercial embodiment of the invention. Structure and arrangement however may be modified and changed as regards the immediate illustration, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

FIG. 1 is a plan view illustrating diagrammatically the supply of articles to the central assembly station and the shifting of completed loads alternately to left and right to the discharge stations.

FIG. 2 is a diagrammatic cross sectional view as on the line 2—2 of FIG. 1 illustrating transfer of a completed row or layer of objects from the endless supply conveyor to the layer stacking table and discharge of the completed stacked load to case or carton located over the discharge throat.

FIG. 3 is a front elevation and part sectional view of the machine embodying the aforesaid features.

FIG. 4 is a top plan view of the machine.

FIG. 5 is a vertical cross sectional view of the machine on substantially the plane of the line 5—5 of FIG. 4.

FIG. 6 is a wiring diagram.

In FIG. 1 the articles or objects to be packed, in this case boxes 7, which may have come from a packaging line are supplied to a belt conveyor 8 which carries them up against a front stop 9 having a ready switch 10, in front of a pusher 11.

This pusher will not operate until the supply has accumulated upstream to a point where the surplus switch 12 is located, whereupon the pusher head 13 with cutoff

skirt 14 will shear the correct number of boxes off the end of the accumulated row, holding back the others until it returns to retracted position.

In its forward stroke the pusher projects the extracted row of objects into an open ended and open bottom hopper 15 over a table 16 which serves as the bottom of the hopper, supporting the layer of boxes ejected by the pusher.

The conveyor 8 may be a continuously running belt which will keep articles piled up against the front stop, replacing those shifted from the belt to the receiving table 16.

As each layer is deposited on this table, or on top of a layer previously placed on the table, the table is stepped down, a layer at a time, as indicated in FIG. 2, until a stack of layers constituting the full case load, in this instance three layers, is reached, whereupon the loaded hopper will be shifted laterally to a position in front of one of two discharge rams 17, 18 and one of the signal lights 35, 36 at such discharge stations will be energized to show which load is ready. Then, at the will of the operator, as by operation of a foot switch, the discharge ram at the load-ready station will be energized causing head 19 of the approximate size of the load, to push the load through a guide throat 20 over which a case or carton 21 to be loaded is placed.

This discharge throat is shown as tapered to guide the load and to serve as a support over which the open carton may be held by an operator who may energize the discharge ram 17 by a foot switch 26.

FIG. 1 shows two loading hoppers 15 and 23 spaced apart a distance equal to the distance between the load assembler and the discharge rams at opposite sides of the same and these two hoppers are shifted to carry each hopper alternately into register with the load assembler and with one of the discharge rams.

In FIG. 1 the left load receiver or hopper 15 is shown lined up with the assembler pusher 11 and the right hand hopper 23 is shown lined up with the right hand load discharge ram 17.

In this relation, with the left hand empty hopper 15 in front of the assembler 11 and the loaded right hand hopper 23 in front of the right hand discharger 17, both discharger and the assembler may be in operation, the assembler making up a fresh load in the empty hopper while the discharger is ramming the previously formed load into the case 21 held over the guide throat 20.

As soon as the load is discharged from the right hand hopper and the left hand hopper is loaded, which operations may be effected all at substantially the same time the two hoppers are shifted over to the left to locate the loaded left hopper in line with the left hand discharger 18 and the emptied right hand hopper 23 in line with the centrally located assembler.

A case 24 then is placed over the left hand discharge throat 25 and the foot switch 26 operated to energize the left discharge ram.

While the load is being ejected by the left hand ram 18 the assembler will be operating to load the emptied right hand hopper 23.

Thus no time is lost in transfer operations, the assembler is making up loads and loading the magazines, one after another, practically continuously and at the same

time the dischargers are operating one after another to take away these loads and ram them into the load containers.

FIG. 3 is a front view of tthe machine showing the load assembling mechanism at the center and the discharge stations at opposite sides of the same and the load receiving hoppers shifted to the right with the left one in line with the assembler and the right one in line with the right hand discharger.

This view also shows that there are two layer forming tables or elevators, **16** and **27**, one for each of the hoppers, operated by power cylinders **28, 29** and all mounted on a laterally traveling carriage **30** operating on guide rods **31**, shifted by a power cylinder **32**.

The table lowering cylinders **28, 29** have step switches **33** for effecting lowering of the tables one step as each layer is completed and bottom position switches **34**.

The carriage movement is timed by switches under control of the loader and all controls are in interlocked relation so that the carriage will not shift until the outside load has been removed and the center load has been completed.

The conveyor belt may be of rubber, leather, plastic or other smooth material which will not mar or scratch the packages as it slides beneath those held by the front stop.

The switches are interconnected so that the pusher at the loading station will not operate until an oversupply of boxes or packages is accumulated, the elevator at the loading station will not lower until a row of packages is in place, the carriage will not shift until a case load is made up and the load ahead of it has been ejected or cased and the machine will not continue in operation until the operator closes the switch to put the load into the case, the machine being thus under control of the operator at all times.

The central loader stops automatically when enough tiers have been set up to form a complete load. It will not attempt to overload a hopper.

An emergency push button located in convenient reach at **38**, FIGS. 3 and 4, operates a valve at **38'**, FIG. 5, to shut off air supply to the machine and bleed air from the cylinders leaving them free for movement manually, as for releasing boxes that may have been caught or be in wrong position. Since the electric control system is not shut off, restoring the air supply with a second push button **39** will cause the machine to continue its cycle without having to start a new cycle.

FIG. 6 is a simplified form of wiring diagram showing how the controls for the various actuating mechanisms are interlinked and interlocked so that the mechanisms described will operate in prearranged order to accomplish the objects set forth. Essential parts referred to in the foregoing specification are so marked in the diagram so that the action will be clear without further detailed description.

In addition to the parts described the diagram includes a "Relay Test" section by which different relays may be plugged in and tested independently of the machine operating circuits to ascertain their operativeness, the three signal lights shown applying to the different types of relays used in the machine.

What is claimed is:

1. A case packer comprising the combination of a pair of case load holders for holding each a case load of objects to be packed, a load assembler having means for assembling and placing a case load of the objects in predetermined load formation into one of said case load holders, a pair of load dischargers having means for discharging a case load from a loaded case load holder, means for shifting one of said case load holders from said assembler to one of said dischargers and the other case load holder from the other discharger to said assembler and to then shift the first case load holder from said first mentioned discharger back to the assembler and the second mentioned case load holder from the assembler to the second discharger and means for actuating said load assembler to case load a holder when an empty holder is shifted to the same and to actuate one load discharger to discharge a holder when a loaded holder is shifted to the same and whereby said dischargers may alternately discharge case loads one after another while said assembler is loading empty holders shifted to the same from said dischargers.

2. The invention according to claim 1 in which said load dischargers are spaced equal distances to opposite sides of said load assembler and said load holders are spaced apart a distance equal to the distance between said assembler and each discharger and said holders are shifted a distance in each direction equal to the spacing between said assembler and said dischargers.

3. The invention according to claim 1 in which said holders are in the form of hoppers mounted in spaced relation on a reciprocating carriage.

4. The invention according to claim 1 in which said holders each have a layer receiving table and means for lowering the same step by step as each layer of objects is deposited thereon.

5. The invention according to claim 1 in which the load assembler comprises a traveling conveyor for the objects to be packed, a pusher for stripping a predetermined number of objects off the conveyor, a front stop controller for objects on the conveyor, a controller at a distance in front of said front stop controller said controllers being connected with said pusher to effect actuation of the same when objects have accumulated on the conveyor from said front stop back to the position of said second mentioned controller.

6. The invention according to claim 1 in which said means for actuating the load assembler and load dischargers comprises a controller connected to effect the actuation of said assembler and dischargers only after an empty load holder has been located at the assembler station and a loaded holder has been located at one of said discharger stations.

7. The invention according to claim 1 in which said means for actuating the load assembler and load dischargers comprises a controller connected to effect the actuation of said assembler and dischargers only after an empty load holder has been located at the assembler station and a loaded holder has been located at one of said discharger stations and including a manually operable switch with the assembler and dischargers connected to remain inoperative at the completion of a load assembly cycle until said manually operable switch is actuated.

8. The invention according to claim 1 in which said load holders comprise load receiving hoppers, object receiving tables forming the bottoms of said hoppers, means for lowering said tables step by step as layers of objects are deposited thereon and a reciprocating carriage mounting said hoppers and arranged for travel to alternately register said hoppers with the assembler and with one of said dischargers.

9. A case packer comprising means for receiving and accumulating items to be packed into orderly row relation at a loading station, a load receiving hopper, means for pushing a measured quantity of items from an accumulated supply at said loading station into said load receiving hopper, means for preventing the loading of a partial row of items into said load receiving hopper, load dischargers at opposite sides of said loading station, a carriage located to alternately register said hopper with said loading station and with one of said dischargers, means for accumulating predetermined tiers of items within said hopper, means on said dischargers for discharging the predetermined accumulated loads of items from said load hopper into cases and means under control of an operator for effecting sequential coordinated operation of the

related means described and for deenergizing all machine functions.

10. A case packer comprising the combination of means for continuously accumulating an oversupply of the items to be packed, means for removing a measured quantity of such items from the oversupply of the same, means for stacking said measured quantities of items in tiered case loads and means for discharging said case loads into cases for accommodating the same, said means for stacking the measured quantities of items including load receiving hoppers in spaced relation and means for shifting said hoppers to alternately register them with said means for removing the measured quantities and with said means for discharging the tiered loads into the cases.

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