

Jan. 31, 1956

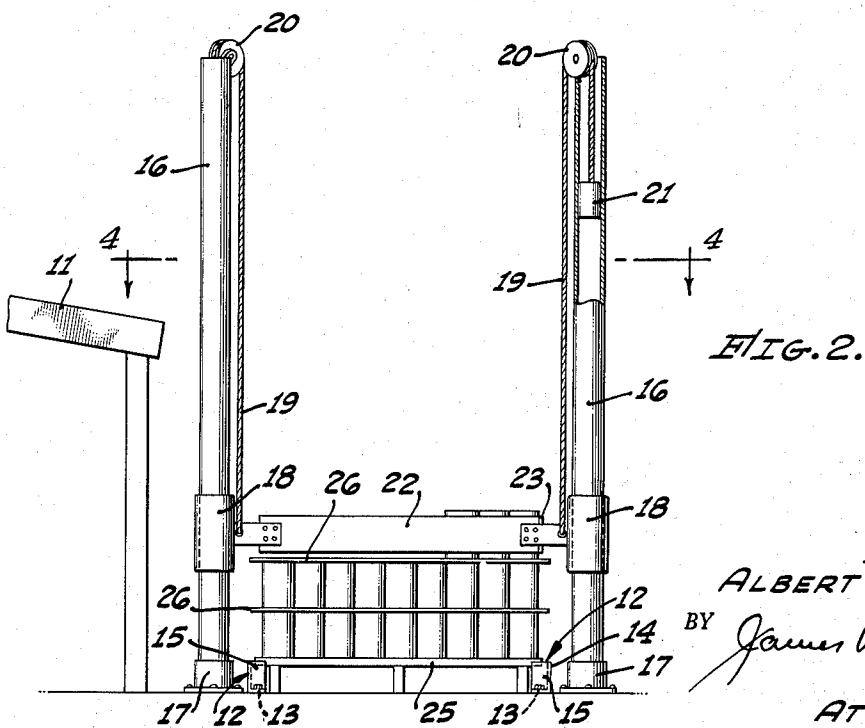
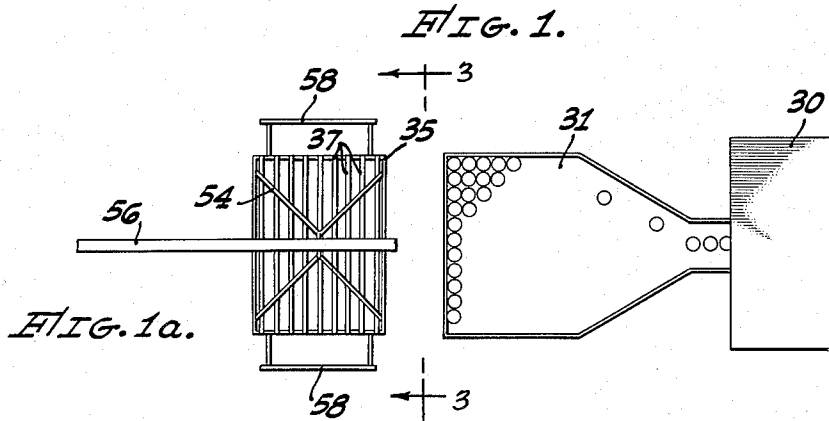
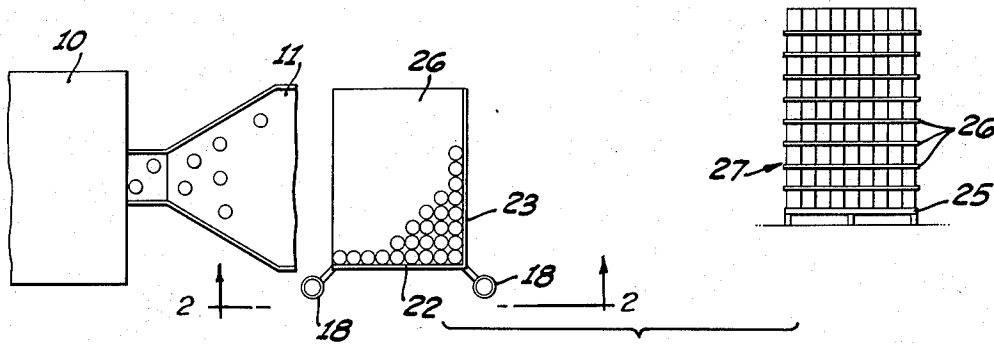
A. HORNER

2,732,957

APPARATUS FOR PALLETIZING CANS

Filed March 9, 1950

2 Sheets-Sheet 1



INVENTOR.

ALBERT HORNER

BY

James M. Albert

ATTORNEY.

Jan. 31, 1956

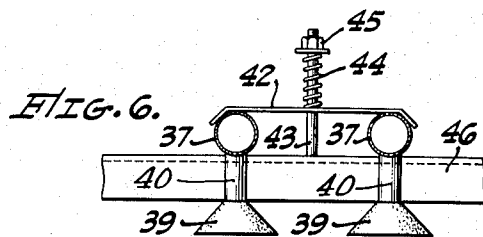
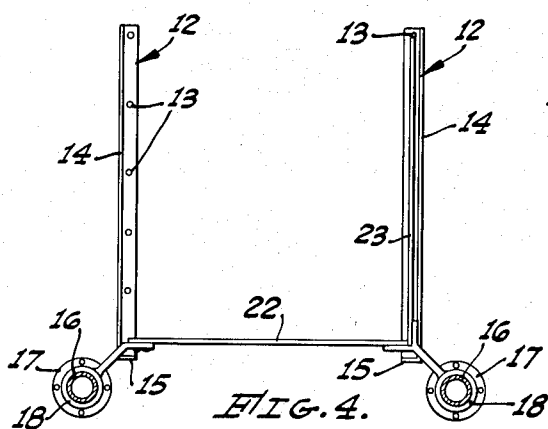
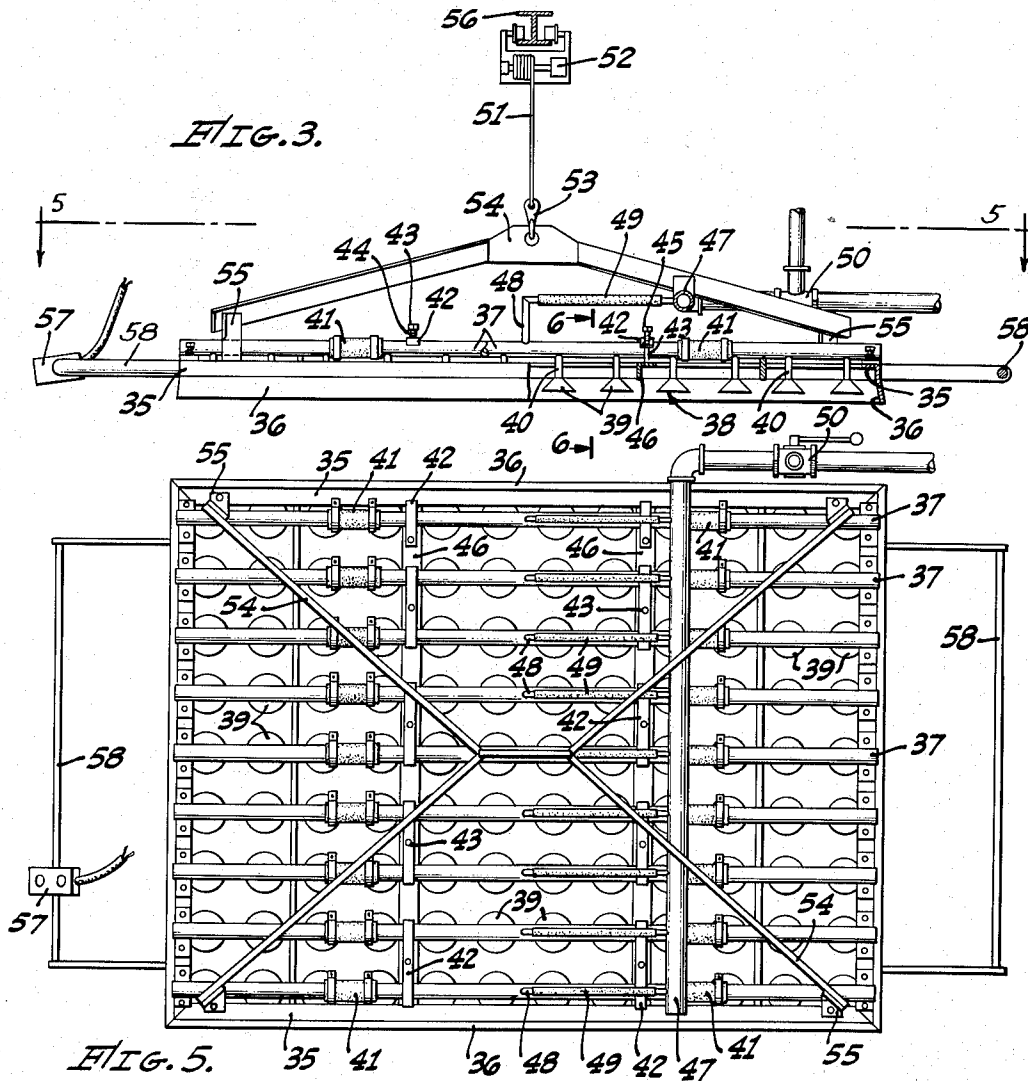
A. HORNER

2,732,957

APPARATUS FOR PALLETIZING CANS

Filed March 9, 1950

2 Sheets-Sheet 2



INVENTOR.
ALBERT HORNER
BY *James M. Abbott*
ATTORNEY.

1

2,732,957

APPARATUS FOR PALLETIZING CANS

Albert Horner, Kapaa, Kauai, Territory of Hawaii, assignor to Hawaiian Canneries Company, Limited, Kapaa, Territory of Hawaii, a corporation of the Territory of Hawaii

Application March 9, 1950, Serial No. 148,630

1 Claim. (Cl. 214—6)

This invention relates to a method and apparatus for handling and storing containers.

In many canning factory procedures the closed and/or processed cans are not immediately labeled and cased for shipment at the time of canning. Quite frequently the canning proceeds at a pace commensurate with the supply of the product and the cans of such product are stored pending subsequent demand by the wholesaler of such products. Such demands are frequently accompanied by specific instructions as to labeling and the cans are therefore stored in the interim, unlabeled. Upon request for shipment the cans are conveyed to the labeling machines and labels in accordance with the specific demands of the purchaser are applied at the time of shipment. The procedure commonly involved in production along the above lines is to case the cans after closing or processing in cartons or storage crates, stacking such crates or cartons until they are demanded, and at such time dumping the cans from the crates or cartons heterogeneously at the labeling machine to which they are fed after being properly set up in orderly fashion for the labeling operation. The casing of the cans at the closing or processing equipment is a time consuming and expensive operation. Skill and experience is required of the operatives in order to develop a dexterity adequate to load the cartons in time with the closing equipment. In dumping the cans from the cartons at the labeling machine either special dumping equipment is required or expensive manual labor is utilized, and in either event a serious loss is involved due to the mutilation of cans and the destruction of the cartons.

The present invention provides a method of and apparatus for handling the cans between the usual closing or processing apparatus and the labeling machine which avoids the intermediate use of cartons and crates and therewith avoids the expense of packers at the carton or crate sealing machine and minimizes the labor requirements at the labeling machine, as well as avoiding the danger of losses due to mutilation of the cans. It is therefore an object of the invention to provide a method and apparatus for expeditiously handling the cans between the closing and/or processing thereof and the labeling of the cans before shipment. This general object is attained by the use of novel method steps and improved apparatus to the end that cartons are not required for intermediate storage, and the expenses incident to the losses resultant from the use of such cartons are avoided.

The invention is illustrated by way of example in the accompanying drawing in which:

Fig. 1 is a top plan schematic view of an arrangement of the apparatus of the present invention for carrying out the present method.

Fig. 1a is a view in plan showing the apparatus used in the second step of transfer from the stacking station to a labeling station.

Fig. 2 is an enlarged side elevation of the stack forming jig of the present invention taken as indicated by the line 2—2 of Fig. 1 looking in the direction of the arrows.

2

Fig. 3 is an enlarged side elevation of the can transfer device of the present invention taken as indicated by the line 3—3 in Fig. 1a.

Fig. 4 is a horizontal sectional view of the apparatus shown in Fig. 2, and is taken on line 4—4 of the latter.

Fig. 5 is a horizontal sectional view of the apparatus of Fig. 3 taken on line 5—5 thereof.

Fig. 6 is an enlarged section taken on line 6—6 of Fig. 3.

In carrying out the method of the present invention the cans are delivered from a can double seaming machine, or from a processing apparatus, to a pallet upon which they are stacked in orderly fashion, preferably by the use of the jiggling apparatus of the present invention shown in detail in Figs. 2 and 4 of the accompanying drawings. The bare cans as they are received from the can double seaming machine or processor are arranged on the pallet in successive vertical courses, each comprising uniform transverse rows of cans. The cans of each course are arranged in axial alignment with the cans of the next adjacent course, and intermediate sheets of kraft paper or the like are arranged between the successive courses. When a sufficient height of cans is stacked upon the pallet, the pallet is removed to a storage space and a succeeding pallet is loaded in like manner. It will be noted that in thus loading the pallet no cartons are required and a minimum of manual labor is required in stacking the cans in the manner prescribed. When the cans are to be labeled and shipped the pallets are taken successively to the labeling machine, where the cans are removed course by course and are deposited in orderly fashion on the receiving table of the labeling machine. The removal of the cans from the pallet is preferably performed by the unstacker shown in Figs. 3 and 5 of the accompanying drawings by which the transfer of the cans is accomplished without disturbing their orderly arrangement and without danger of damage in such transfer. By the use of the foregoing method it is obvious that a material saving in labor is effected as well as a saving in the cost and maintenance of cartons or equivalent crates or tote boxes. The method also avoids the danger of can mutilation during the handling operations.

The apparatus of the present invention includes a jiggling device involving a pair of right angularly arranged and vertically adjustable guide rails with relation to which the pallet is positioned so that as cans are fed to the pallet they may be conveniently formed into the desired parallel rows by a minimum of manual assistance. As each successive course of cans is arranged on the pallet the rails are raised to act as guides for the next successive course. The can layer carrier of the present invention comprises a can lifting frame having parallel rows of suction can lifting devices equal in number and arrangement to the cans of each course. When the pallet is positioned adjacent the labeling machine the lifting frame is moved over the pallet and the lifting devices are caused to engage the cans of the uppermost course. The carrier is then lifted with the cans and moved over the receiving table of the labeling machine. The carrier is then lowered to the table and the cans released, thus depositing the cans in orderly fashion onto the table without the danger of can mutilation inherent in the usual dumping of cartons of cans.

In Fig. 1 of the drawings the numeral 10 diagrammatically illustrates a can double seaming or processing machine from which cans ready for labeling are delivered to the delivery table 11. It will be understood that in some factory procedures the cans are processed after sealing while in other plants the final operation before storage and labeling is the sealing or double seaming. The present invention is applicable to either procedure and it will be understood that the apparatus 10

may be either the seaming machine or a processing apparatus, or any other equipment from which the cans are delivered ready for labeling. The delivery table 11 of the apparatus 10 is here shown as a so-called fishtail table, which is of increasing width as it extends from the machine 10. Such tables are commonly employed in devices of this nature and permit the cans to mass together at the discharge end in rows transverse of the table. Such tables are commonly mounted in a tiltable position so that the discharge end of the table may be successively elevated during the discharge of the cans to accommodate a successive increase of cans on the pallet. A tiltable or sloping fishtail table is contemplated in the present disclosure. It will be understood, however, that the apparatus and method of the present invention is in no way limited to such a discharge arrangement for the apparatus 10.

The jiggling device of the present invention, as illustrated in detail in Figs. 2 and 4 of the drawings, is located adjacent the discharge of the table 11. This device comprises a floor jig formed by a pair of angle bars 12 bolted or otherwise secured as by bolts 13 to the floor adjacent to the discharge end of the table 11. The upwardly extending side flanges 14 of the bars 12 form guides for a pallet while terminal ends 15 of the bars form stops so that a pallet will be guided to and located at a fixed position with respect to the table. Adjacent to the floor jig there is mounted in vertical position a pair of hollow tubular standards 16 arranged in parallel relation at one side of the discharge end of the table. The standards 16 are secured to the floor in fixed relation to the floor jig by means of suitable floor plates 17. Each standard has slidably mounted thereover a loosely fitting guide sleeve 18, the sleeve 18 of each standard being parallel and supported for parallel sliding movement over the standard by cables 19 which extend upwardly from the sleeves 18 over pulleys 20 and therefrom into the hollow bodies of the standards to be secured to counterweights 21 slidably within the standards. Intermediate the standards 16 the sleeves 18 are provided with a side guide bar 22 comprising a vertically disposed plate against which the cans are racked to form a side row of cans of the successive courses stacked upon the pallet. The stacking jig also includes an end bar 23 carried by the outer sleeve 18 and constituting a rigidly mounted vertically disposed plate lying in the plane of the bar 22 and extending at right angles thereto. As cans are delivered from the table 11 to the pallet, indicated at 25, or to the successive courses on the pallet they are forced against the end bar 23 as well as against the side bar 22, and are thus formed into the desired number of transverse and longitudinal rows. Since the bars 22 and 23 are disposed upon only two contiguous sides of the pallet an operator may stand at the free side of the stack to direct the cans and to elevate the stacking jig and the delivery table as successive courses of cans are delivered to and arranged upon the pallet.

At the completion of the arrangement of the cans of each successive course, a sheet of kraft paper or like material 26 may be laid upon the cans to preclude air passage between the courses during storage and to assist in tying the stack together, the stacking jig is elevated to the height of the next successive course, and the stacking continues. When the desired height of stack is achieved the pallet is removed and a new pallet is placed in position and a new series of courses is laid thereon. The pallet with the cans stacked thereon may of course be delivered directly to the labeling machine if desired. However, since the production frequently exceeds the immediate demand the loaded pallets are usually stored in a convenient storage space, indicated at 27, until labeling is desired. In transporting the pallets to and from the storage space it will be understood that the

usual motorized lifting and transporting trucks may be utilized in the same manner as when pallets are loaded with cartoned cans. By the stacking method and apparatus herein outlined the stacks will be self-retaining and the use of cartons, boxes or crates is not required, and the labor required to manually lift and place each can in the carton is avoided.

When an order is received for the shipment of labeled cans the pallets are conveyed successively by the trucks to the vicinity of the labeling machine where the unloading apparatus is located. Heretofore the labeling machine 30 (Fig. 1a) was supplied with the bare cans by dumping the individual cartons onto the receiving table 31 in random fashion. Not only was a subsequent orderly arrangement of the cans required for feeding to the labeling machine 30 but a considerable loss occurred due to mutilation of cans which had to be discarded. By the present apparatus and method each successive course of cans is lifted intact from the stack and laid in formal order upon the feed table or feed belt 31 of the labeling machine 30. While the machine 30 is here designated as a labeling machine it will be understood that the present method and apparatus may be employed in the delivery of cans to other apparatus as for instance to the delivery of cans labeled or otherwise to carton filling stations. The can layer carrier of the present invention may also be used in a reverse manner to form stacks of cans or in any other manner in which it is desired to transfer prearranged courses of cans from one position to another.

Referring more particularly to Figs. 3 and 5 of the drawings it will be seen that the unstacking or can layer carrying apparatus of the present invention involves an angular, substantially rectangular frame 35 disposed in a horizontal plane and mounted for movement to and from the labeling machine table 31. Depending from the peripheral edge of the frame 35 there is provided a downwardly extending slightly flared guide flange 36. The frame 35 is designed to conform in size and shape with the stack of cans formed upon the pallet and the guide flange 36 conforms to the outside dimension of such stack so that as the frame is lowered over such stack the guide flange will assist in locating the frame in exact registry with the stack. Between the end members of the frame and extending in parallel longitudinal direction within the frame there is provided a group of vacuum pipes 37 equal in number and spacing to the longitudinal rows of cans in each course. Each vacuum pipe 37 is provided with a row of suction can lifters 38. The number and spacing of the lifters 38 of each pipe 37 is equal to the number and spacing of the cans of each longitudinal row of cans formed on the pallet. The spacing of the lifters 38 of each row is also equal to the spacing of the pipes 37, so that parallel transverse and longitudinal rows of lifters 38 are presented in exact accordance with and designed for registration with the cans of each course of cans of the stack on the pallet.

In the present form of the invention the lifters 38 comprise suction cups 39 mounted upon the lower ends of tubular stems 40. The cups 39 are disposed in an inverted position opening downward and are so located as to register centrally with the individual cans of the stack. The stems 40 are mounted on and communicate with pipes 37. The pipes 37 have intermediate flexible couplers 41 which permit flexing of pipes 37 with respect to the rigid frame 35. Each longitudinally extending suction pipe 37 is provided with two of such couplers equally spaced and disposed on opposite sides of the center of the frame. The pipes 37 with their couplers 41 are flexibly secured in pairs to the frame by thin flexible cross strips 42 which overlap each adjacent pair of couplers. The central portion of each strip 42 is secured for limited vertical movement relative to the frame 35

by vertical bolts 43 over which the strips 42 are loosely mounted and are secured by springs 44 mounted on the bolts 43 and held in tension against the strips by securing nuts 45. The bolts 43 are supported by transverse angle members 46 extending across the frame just inwardly from the location of the coupling members 41. By the arrangement thus outlined it will be noted that the individual lifters 38 may have individual limited and resiliently restrained vertical motion with respect to the frame so that such lifters may individually accommodate themselves to variations of the location of the upper surface of the cans when the frame is disposed over the stack. When the frame is lowered upon a course of cans suction may be applied to the cups 39 so as to secure the cans thereto by way of the hollow stems 40 and the suction pipes 37 by means of a main suction tube 47 joined by individual connections 48 and flexible hoses 49 with the vacuum pipes 37. The control of suction applied to the cups 39 is provided by means of a three-way manually controlled valve 50 by which suction may be created within the system while the valve is in one position or relieved when in another position.

The frame 35 with its can lifters and their operating and mounting means is arranged for bodily movement by suspension through a cable 51 carried by a motorized lifting hoist 52. The cable 51 is secured by a removable hook 53 to a lifting frame 54 extending as a spider over the frame 35 and secured thereto adjacent the corners thereof, as indicated at 55. The hoist 52 is preferably mounted upon an overhead rail 56 disposed in a position to extend over the table 31 of the labeling machine 30. The rail 56 extends from the table 31 to a position convenient to the pallets which may be moved to such position by suitable trucks, or it may extend directly to the storage space for the cans. The hoist 52 is preferably controlled to raise or lower the frame 35 by means of a control switch 57 conveniently located on one or the other of the extending guide handles 58 carried by the frame and by which the operator guides the frame to position over the stack of cans on the pallet or over the table 31.

When the cans previously stacked in courses upon the pallets are to be labeled the pallets are moved under the trolley, the hoist 52 is moved along the trolley to a position over the stack, the hoist is operated to lower the frame, and the operator guides the frame over the stack with its guide flange 36 acting to accurately locate the frame with its lifters in alignment with the cans of the top course. It will be understood that the cans which are being handled have been capped on at least one end. If the cans are empty the cap ends are presented upwardly as will be the case when the cans are full. However, the imperforate surface of the caps will be contacted by the lips of the cups 39. Suction is then applied to the lifters by manipulation of the valve 50 and the cans are thus secured to the lifting devices 38. The hoist is then operated by control of switch 57 to control the electric circuit of the hoisting unit 52 to raise or lower the frame 35 with the cans of the top course, and the hoist and frame are then moved along the trolley 56 to locate the frame over the table 31. With the frame disposed over the table 31 the hoist is again operated to lower the frame to place the cans on the table. The valve 50 is then opened to release the cans and the hoist is operated to raise the frame from the cans and to return the frame to the stack. It will thus be seen that the cans are removed from the stacks and deposited upon the table in orderly fashion with a minimum of labor, without the use of intermediate cartons and without any danger of damage to the cans.

When delivering a pallet 25, carrying a stack of cans thereon, to the can layer carrier of the invention so that the latter may be employed to transfer the cans of said stack, one layer at a time onto the table 31, a floor jig similar to that formed by the angle bars 12 may be provided to properly locate the loaded pallet in its proper

relation with the overhead rail 56 so as to render it relatively easy for the operator to bring the can layer carrier into super-imposed relation with the stack carried on said pallet so that this carrier might be used to transfer the cans in said stack, one layer at a time, onto the table 31.

By the same token, the pallet jig shown in Fig. 2 may be aligned with the overhead rail 56, so that when it is desired to use the can layer carrier to form stacks of cans, the right angle forming jig bars 22 and 23 may be positioned at each successive level, as the can layer carrier delivers a layer of cans in the forming of a stack, to properly locate successive layers in vertical alignment with the layers therebelow. As the bars 22 and 23 and the sleeves 18 on which they are mounted are counter-balanced by weights 21 and are freely shiftable vertically, bars 22 and 23 can readily be positioned to engage the cans of a layer being delivered in forming a stack without getting in the way of the guide flange 36, which extends downwardly a short distance below the upper ends of the outermost cans in the layer.

In carrying out the present invention, both as to method and apparatus, it will be understood that various modifications in operation and in the structure of the apparatus may be resorted to without departure from the spirit or scope of the present invention as outlined in the appended claim.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

In an apparatus for handling cans, the combination of: an overhead rail; a hoist carried by said rail for travel over said rail; a cable adapted to be lifted and lowered by said hoist; a can layer lifter suspended on said cable said lifter being provided with suction devices properly spaced and located in a horizontal plane so that each of said devices will engage and adhere to one can of a layer of cans when said lifter is lowered onto said layer and said devices placed under vacuum; handles on said lifter for manually manipulating said lifter to propel said hoist along said rail; a pallet jig mounted for positioning a pallet directly beneath and in symmetrical alignment with said rail, said pallet being of a suitable size for receiving said layer of cans from said lifter; and a can layer jig associated with said pallet jig and shiftable vertically so it may be located at any given level for engaging only one end edge face and only one side edge face of any can layer as said lifter carrying said layer is manually maneuvered by a horizontal movement into position over said pallet, with said can layer at the same level as said can layer jig, thereby assuring that each can layer deposited by said lifter on said pallet in the forming of a stack is in precise vertical alignment with each of the other layers in said stack.

References Cited in the file of this patent

UNITED STATES PATENTS

388,494	Jennings	Aug. 28, 1888
682,175	Condict	Sept. 10, 1901
1,408,645	Schuman	Mar. 7, 1922
1,514,333	Ooms	Nov. 4, 1924
1,610,363	Davis	Dec. 14, 1926
1,849,680	McKee	Mar. 15, 1932
1,860,143	Fuller et al.	May 24, 1932
1,904,720	Douglass	Apr. 18, 1933
1,987,336	Powell	Jan. 8, 1935
2,062,732	Scull	Dec. 1, 1936
2,228,887	Peterson	Jan. 14, 1941
2,318,444	Wilson	May 4, 1943
2,338,048	Minaker	Dec. 28, 1943
2,390,242	Engler	Dec. 4, 1945
2,453,077	Newton	Nov. 2, 1948
2,466,693	Fischer	Apr. 12, 1949
2,467,113	Deiters	Apr. 12, 1949
2,581,742	Young	Jan. 8, 1952