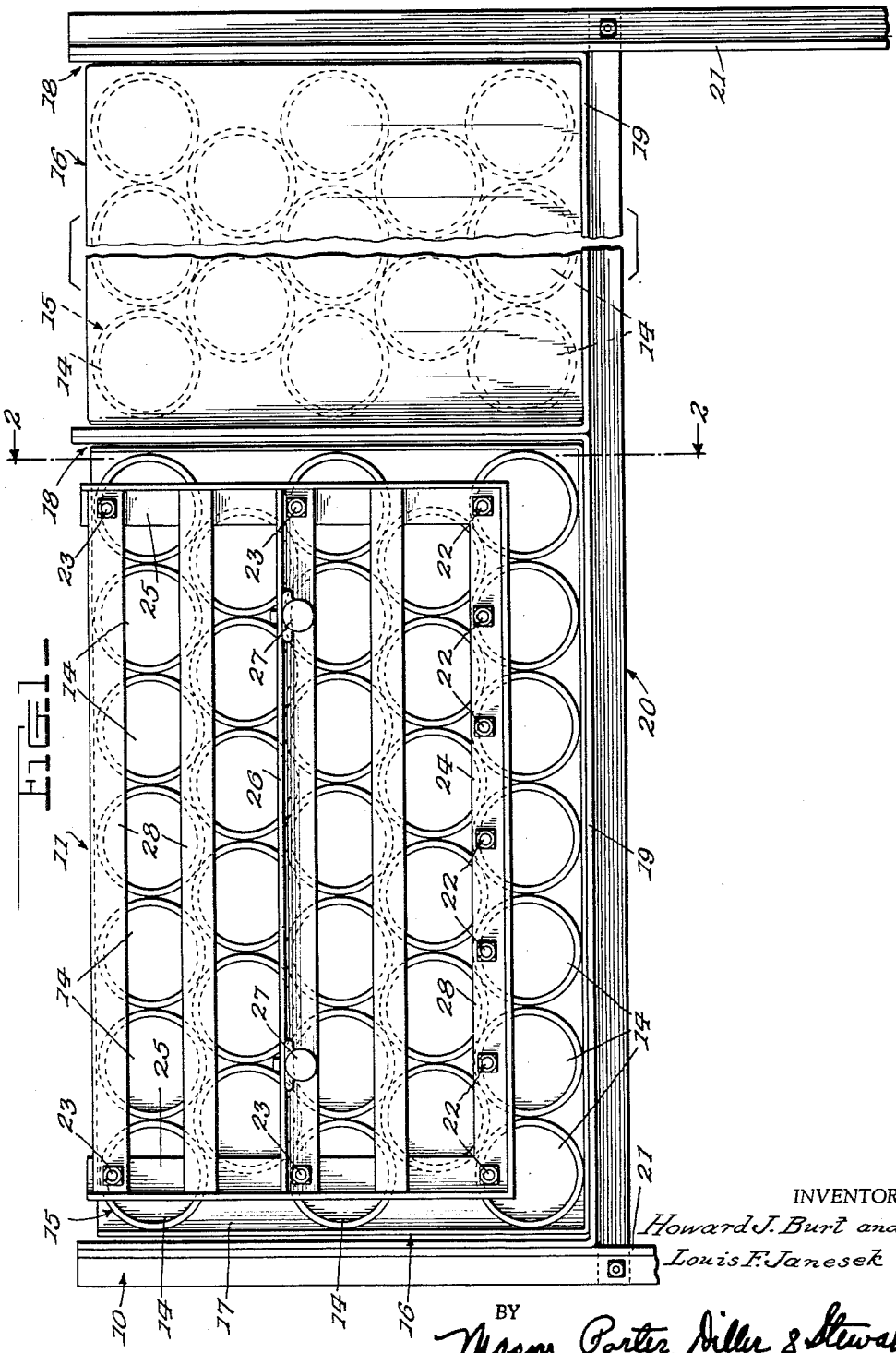
June 14, 1960 H. J. BURT ET AL 2,940,624

CAN UNBAGGING AND TRANSFERRING APPARATUS AND METHOD

Filed April 18, 1956 4 Sheets-Sheet 1



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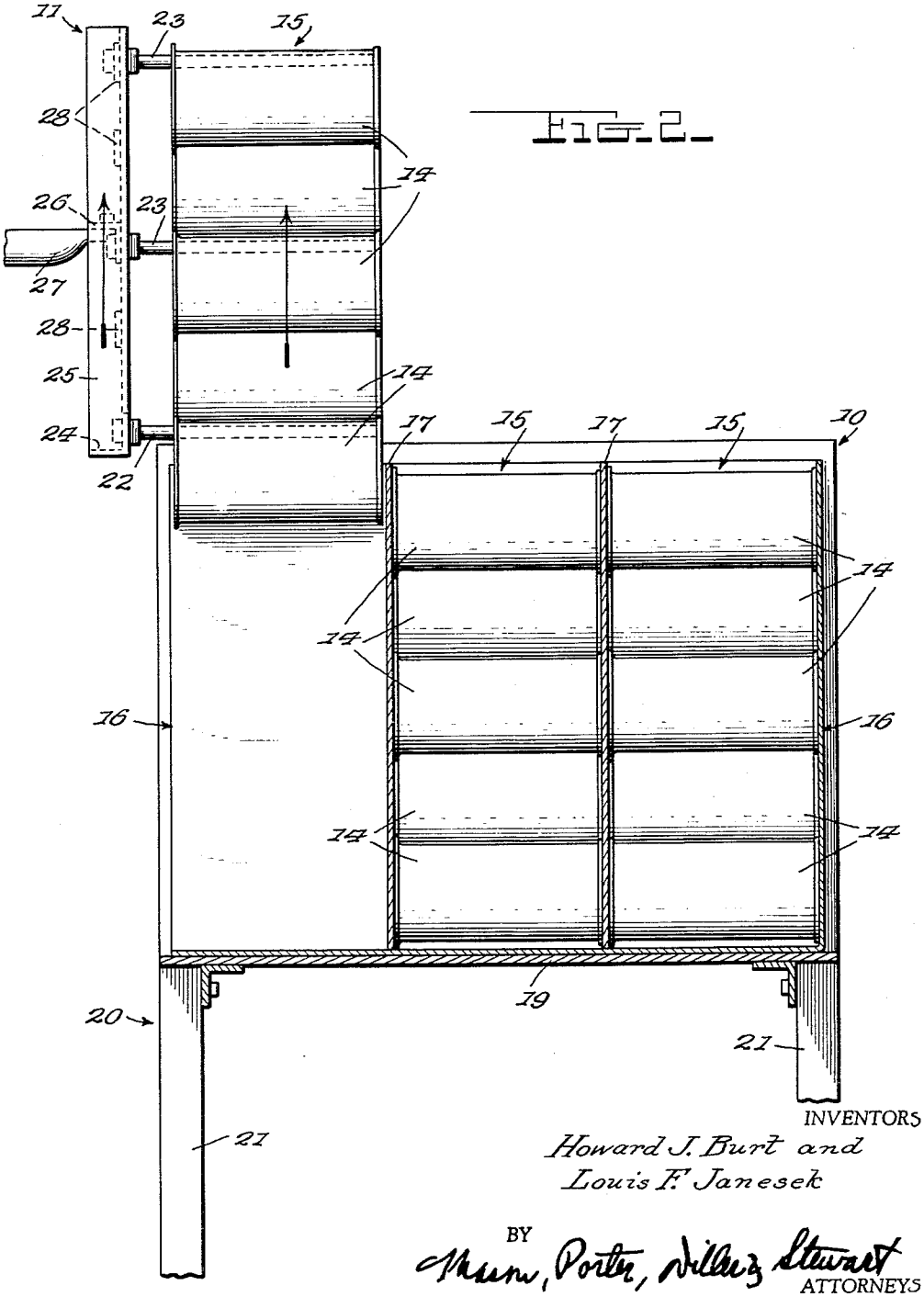
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CAN UNBAGGING AND TRANSFERRING APPARATUS AND METHOD

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FIG. 2



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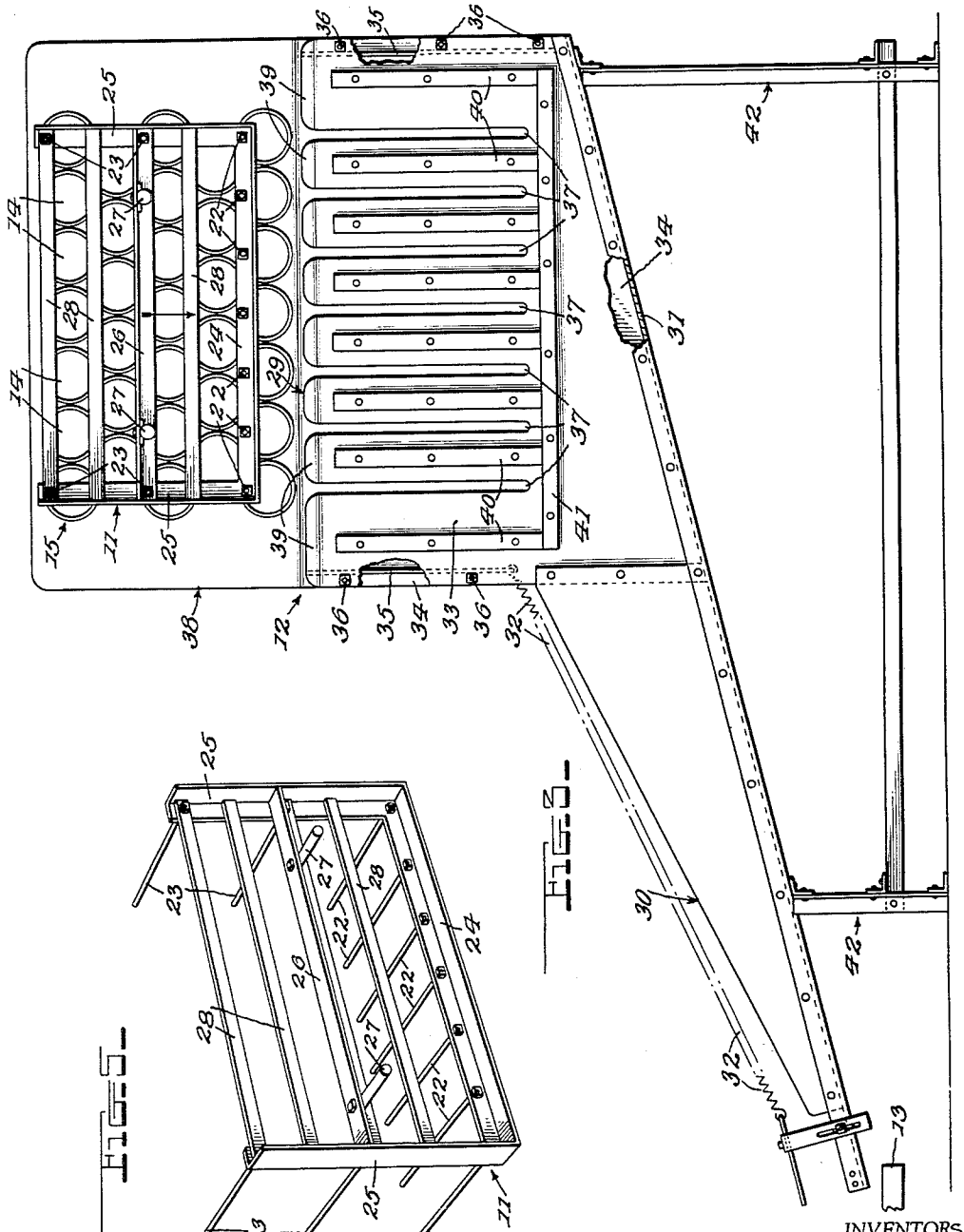


FIG. 5

FIG. 6

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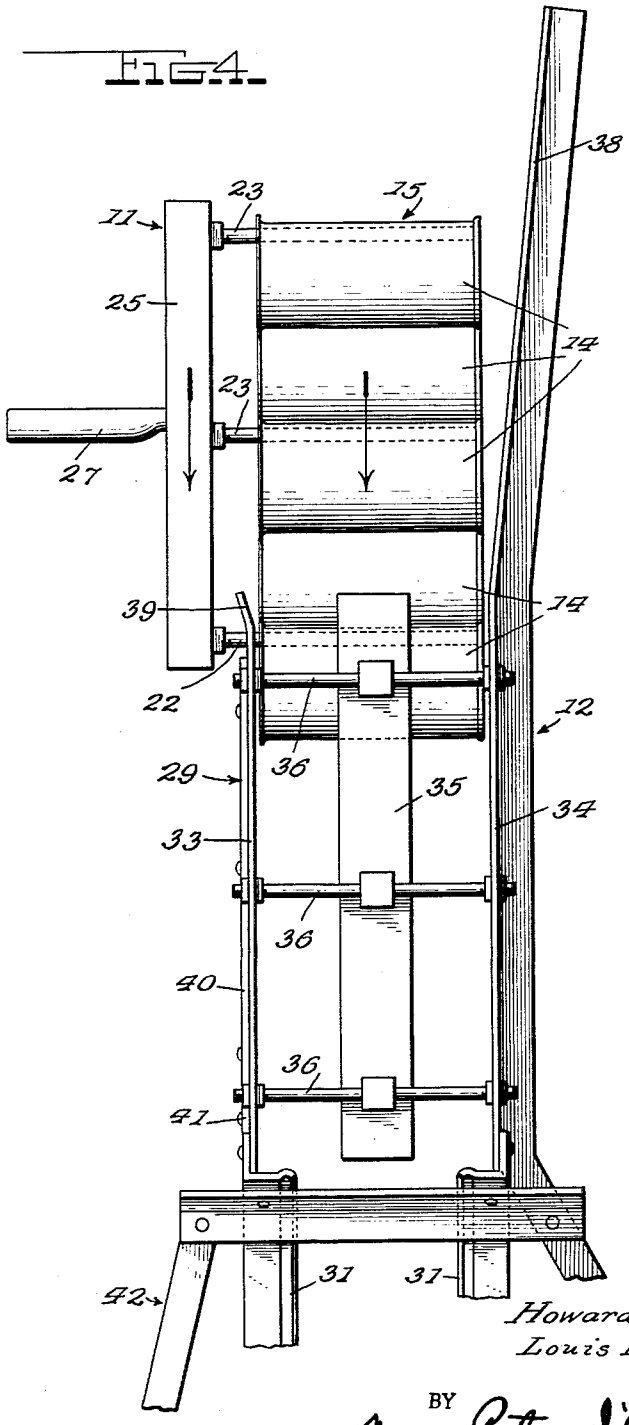
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CAN UNBAGGING AND TRANSFERRING APPARATUS AND METHOD

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FIG. 4.



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CAN UNBAGGING AND TRANSFERRING APPARATUS AND METHOD

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8 Claims. (Cl. 214—152)

In supplying metal cans to canneries and the like, it is customary for the can manufacturer to ship the cans packed in tiers in paper bags. Relatively large plants have ample and rather expensive equipment for rapidly unbagging the cans and presenting them to the customary can conveying means. Most of the relatively small plants, however, lack such expensive equipment and great difficulty is therefore experienced in removing the cans and transferring them to the conveying means with sufficient rapidity for continuous operation of the canning machinery. The present invention has aimed to overcome this difficulty in a simple and inexpensive manner.

The invention provides for manually unbagging the cans one tier at a time, transferring each removed tier as a unit to a doubling boot, and lowering each transferred tier as a unit into the receiving throat of said doubling boot. The cans thus received slide down a runway to a take-away conveyor.

Each tier-packed bag to be unloaded is placed in a bag form, with the cans of each tier lying horizontally row upon row. Then, one vertical wall of the bag is cut or torn off to expose the open ends of the cans of the adjacent tier, and the upper wall of the bag is also removed to upwardly expose all of the tiers. A manually operated fork is then employed to remove the first exposed tier from the bag as a unit, and this same fork is then used to transfer the removed tier as a unit to the doubling boot and to lower the transferred tier into the throat of said boot. The fork is then withdrawn from the boot-received tier and the same fork operations are repeated for each tier until the bag is empty, and in the meantime, another bag has been placed and prepared for unloading. This same general procedure could also be followed should the cans be shipped in cartons instead of bags, but it would then suffice to simply open flaps of the cartons to expose the cans for removal, instead of actually cutting or tearing out portions of the cartons.

The invention has aimed to provide a fork of novel construction for handling the tiers of cans with no danger of seriously disturbing the relation of the cans of any tier, whereby lowering of the tiers into the receiving throat of the doubling boot may be effected without difficulty.

The invention has also aimed to provide the doubling boot with a novel slotted throat, the slots of which receive the fork tines while lowering each tier of cans into said throat.

The invention has further aimed to provide for aiding the fork operator in guiding the tiers of cans into the doubling boot throat and the fork tines into the slots of said throat.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings.

In the drawings:

Figure 1 of the accompanying drawings is a front elevation of the bag form showing one opened bag and one unopened bag of cans therein, the fork being engaged with the exposed tier of cans in readiness for removing it.

Figure 2 is a vertical transverse sectional view on line 2—2 of Figure 1, showing the first tier of cans partly lifted from the opened bag.

Figure 3 is a side elevation of the doubling boot showing a fork-carried tier of cans in readiness for lowering into the throat of said boot.

Figure 4 is an enlarged right end elevation of the doubling boot, showing the fork-carried tier of cans being lowered into the throat of said boot.

Figure 5 is a perspective view of the fork.

The bag form is generally designated at 10 in Figures 1 and 2; the can handling fork is similarly designated at 11 in all views; the doubling boot is similarly designated at 12 in Figures 3 and 4; and in Figure 3, a portion of a take-away conveyor is indicated at 13 in Figure 3 to receive the cans from the doubling boot 12.

The cans 14 are customarily bagged in tiers 15 in paper bags 16, tier sheets 17 being interposed between said tiers. The cans of all of the tiers are usually disposed in alternate relatively short and long rows, with the cans of adjacent rows in nested relation and the open ends of all of the cans disposed in the same direction.

The bag form 10 is shown as having two compartments 18 each of a size to receive a tier-packed bag 16 of the cans 14, each compartment being open at its top and at its front end. The two compartments may well be formed by two U-shaped sheet metal plates 19 secured to a suitable frame 20 having legs 21 for supporting the bag form at convenient height.

One of the loaded bags 16 is placed in one of the compartments 18, with the cans 14 of each tier 15 lying horizontally row upon row. One vertical wall of the bag 16 is then cut or torn out to expose the open ends of the cans of the adjacent tier, as shown in Figures 1 and 2. The uppermost wall of the bag is also removed to upwardly expose all of the tiers 15. The fork 11 is then used to successively remove the tiers 15 and transfer them to the doubling boot 12, and while this is being done, another bag of cans is placed in the second compartment and prepared for unbagging. While this bag is unloaded another bag is placed in the first compartment and so on.

The fork 11 has a series of horizontally spaced tines 22 for reception respectively in the cans 14 of the lowermost row of any tier 15, and said fork has vertically spaced tines 23 for reception in cans at the ends of overlying rows. These tines are preferably about two inches longer than the depth of the cans. In the present disclosure, there are three relatively long rows of cans and two relatively short rows of cans in each tier 15, and the lowermost row is one of the longer. As the fork tines 22 are receivable in the cans of this lower row, these cans are caused to support all other cans of the tier when the fork is lifted. At the same time, the tines 23 which are receivable in the endmost cans of the other relatively long rows, hold the cans supported by the first row against rolling out of place. The entire tier may thus be lifted as a unit from the opened bag (see Figure 2) and transferred as a unit to the doubling boot 12.

A suitable fork head is provided, to which the rear ends of all of the tines 22 and 23 are secured. In the present disclosure, this head comprises a lower horizontal bar 24, two upright bars 25 secured to and rising from the ends of said lower bar 24, and another horizontal bar 26 above the lower bar 24 and secured to the end bars 25, between the ends of the latter. The bar 26 carries right and left rearwardly projecting handles 27. Metal straps 28 may also be provided above and below the bar 26, if desired.

The doubling boot 12 has an upright entrance throat 29, and a lateral chute portion 30 declined to the take-away conveyor 13. The throat 29 is dimensioned to receive a tier 15 of the cans 14 when said tier is lowered by the fork 11 (see Figures 3 and 4). Under this throat, tracks 31 are provided to form a can runway extending to the lower end of the chute 30. The cans, in sliding down this runway, are gradually formed into a single row for reception upon the conveyor 13, and any upward jumping of the cans from the runway is prevented by an overlying guard 32. This guard may well be formed from two tension springs disposed side by side in spaced relation and suitably anchored at their ends.

The throat 29 comprises a vertical front wall 33, a vertical back wall 34, and vertical end members 35, the latter being preferably mounted on stay-bolts 36 which connect said front and back walls. The front wall 33 is formed with vertical slits 37 which open through its upper edge, said slits being so spaced as to receive the fork tines 22 and 23 when the loaded fork 11 is lowered from the position of Figure 3 to deposit a tier of cans in the throat 29.

To aid in guiding the tier into the throat 29, the back wall 34 preferably extends at 38 above the front wall 33 and is steeply inclined rearwardly. Also the upper edge of the front wall is preferably turned forwardly to some extent as seen at 39. It is also preferable to upwardly flare the open ends of the slots 37 to aid in guiding the fork tines into said slots.

For reinforcing purposes, vertical and horizontal bars 40, 41 may be suitably secured to the outer side of the slotted front wall 33.

Any appropriate supporting frame 42 may be provided for the boot 12 to mount it at a convenient height.

The cans can be easily and rapidly taken, one tier at a time, from an opened bag, by means of the fork 11 (see Figures 1 and 2). With this same fork, each removed tier may be transferred to a position over the throat 29, as seen in Figure 3, and the fork may then be lowered (Figure 4) and finally withdrawn to deposit the cans in said throat 29. From this throat, the cans descend in the chute 30 to the take-away conveyor 13. This same general procedure may be followed, if the cans are to be unloaded from cartons, as previously explained herein.

Excellent results are attainable from the construction shown and described, but it is to be understood that variations may well be made within the scope of the invention. Also, it is to be understood that the invention could be advantageously used in can plants for feeding stored cans from different forms of storage containers to different bulk loading systems. Moreover, it should be understood that the invention may be located anywhere for convenient use. It has been successfully employed in railway cars, in warehouses, on plant platforms and within plants, to deliver unloaded cans to existing can runways.

We claim:

1. A method of unloading tier-packed open-end empty cans from a container wherein the cans are arranged in tiers each comprising nested and staggered rows of cans and transferring them to a doubling boot, comprising the steps of laying a tier-packed container of cans in a form with the cans of each tier lying horizontally row upon row, removing one vertical container wall to expose the open ends of the cans of the adjacent tier, removing the upper wall of the container to upwardly expose all of the tiers, forking the adjacent tier of cans from the container without disturbing the staggered and nested relation of the rows thereof and transferring this tier as a unit to the doubling boot, downwardly inserting this transferred tier as a unit into the doubling boot, and repeating the aforesaid forking, transferring and inserting operations for the succeeding tiers of cans.

2. An upwardly open entrance throat for a doubling boot, said entrance throat being dimensioned to receive a fork-carried tier of horizontally positioned cans disposed row upon row, said throat being open at the top and bottom and having an upstanding front wall and an upstanding back wall spaced apart a distance slightly greater than the length of the cans to be received in said throat, said front wall having horizontally spaced vertical slots which open through its upper edge, said slots being adapted to receive the tines of the tier-carrying fork when the latter is lowered to move the tier of cans downwardly into said throat, the tines being then withdrawable in the direction of their axes through said slots upon forward movement of the fork from the cans to strip the cans therefrom.

3. A structure as specified in claim 2, in which said back wall extends above said front wall to aid in guiding the tier of cans into said throat.

4. A structure as specified in claim 2, in which the upper ends of said slots are flared to aid in guiding the fork tines into said slots.

5. A structure as specified in claim 2; said back wall being extended above said front wall to aid in guiding the tier of cans into said throat, the upper ends of said slots being flared to aid in guiding the fork tines into said slots.

6. A structure as specified in claim 2, in which a can runway underlies said throat and declines laterally from the latter to conduct the throat-received cans from the boot, said runway being tapered toward its outer end to dispose the discharging cans in a single row.

7. A fork for handling a tier of horizontally positioned open-end cans disposed row upon row with their open ends positioned in the same direction, said fork comprising horizontally spaced tines positioned for reception in the cans of the lowermost can row, vertically spaced tines positioned for reception in endmost cans of other rows, and a hand-carried fork head to which the rear ends of all of said tines are secured, said fork head having a lower horizontal bar to which said horizontally spaced tines are secured, and two upright end bars rising rigidly from the ends of said horizontal bar, said vertically spaced tines being secured to said upright end bars.

8. A fork for handling a tier of horizontally positioned open-end cans disposed row upon row with their open ends positioned in the same direction, said fork comprising horizontally spaced tines positioned for reception in the cans of the lowermost can row, vertically spaced tines positioned for reception in endmost cans of other rows, and a hand-carried fork head to which the rear ends of all of said tines are secured, said fork head having a lower horizontal bar to which said horizontally spaced tines are secured, and two upright end bars rising rigidly from the ends of said horizontal bar, said vertically spaced tines being secured to said upright end bars, said fork also having a second horizontal bar above said lower horizontal bar and secured at its ends to said upright end bars, and two spaced handles secured to and projecting rearwardly from said second horizontal bar.

References Cited in the file of this patent

UNITED STATES PATENTS

885,580	Breckenridge	Apr. 21, 1908
1,376,446	Lightner et al.	May 3, 1921
1,439,550	Hunter et al.	Dec. 19, 1922
1,853,383	Sneed	Apr. 12, 1932
2,467,113	Deiters	Apr. 12, 1949
2,487,040	Bilodeau	Nov. 8, 1949
2,511,266	Hube et al.	June 13, 1950
2,715,469	Burt	Aug. 16, 1955
2,717,089	Hebert	Sept. 6, 1955
2,717,682	Cadman	Sept. 13, 1955
2,741,379	Stryker	Apr. 10, 1956
2,744,602	Aldred	May 8, 1956

FOREIGN PATENTS

10,334	Great Britain	Sept. 26, 1896