

Feb. 15, 1927.

D. H. GRAY

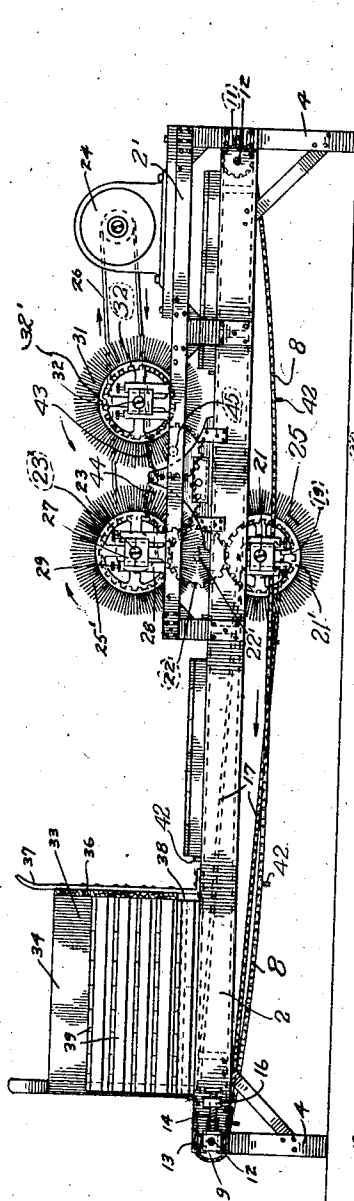
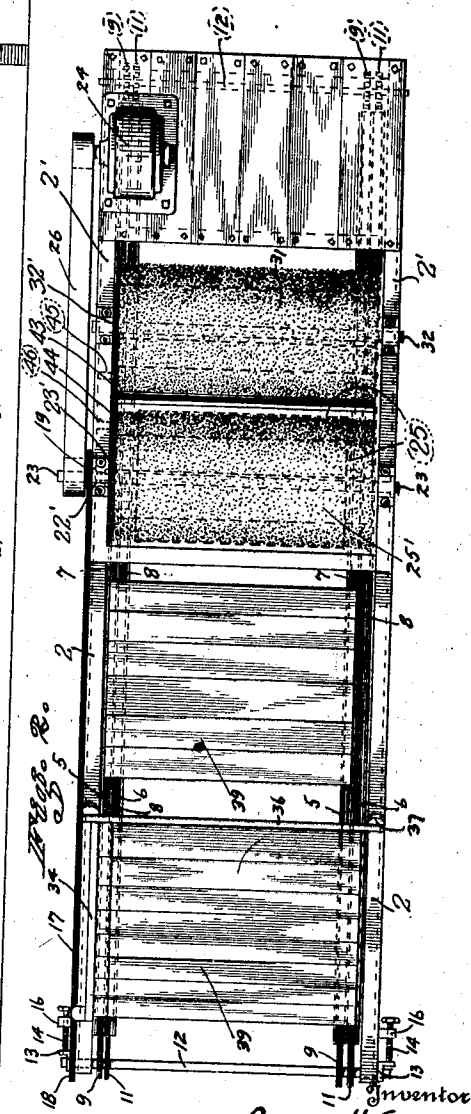
1,617,756

FRUIT TRAY CLEANER

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2 Sheets-Sheet 1

Fig. 11.



DALLAS H. GRAY

Attorney

Attorney

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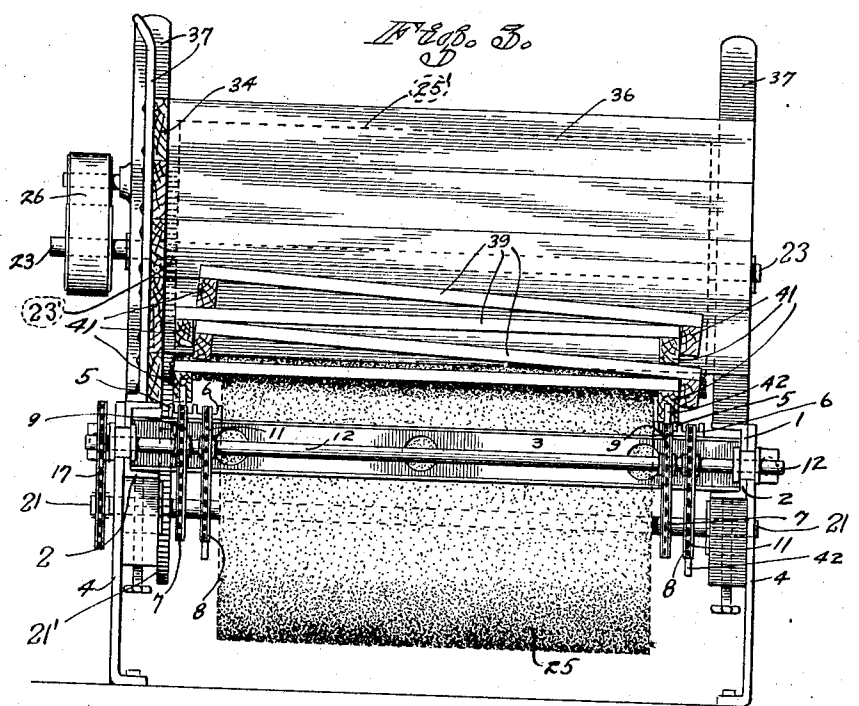
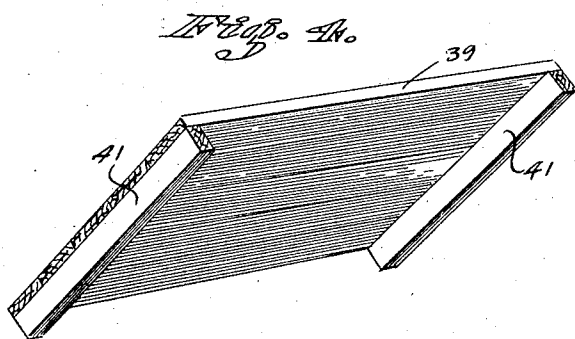
D. H. GRAY

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Inventor
DALLAS H. GRAY

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[Signature]

Attorneys

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UNITED STATES PATENT OFFICE.

DALLAS H. GRAY, OF ARMONA, CALIFORNIA.

FRUIT-TRAY CLEANER.

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The present invention relates to improvements in means for cleaning trays such as are commonly used in the fruit industry for the purpose of spreading the fruit thereon so that the same may be conveniently handled during the drying process. It is customary at the present time to clean the trays individually by means of a hand brush whereby considerable time is consumed particularly in view of the fact that in large orchards many thousands of trays have to be handled every year. For the purpose of facilitating the cleaning of the trays I propose to provide a machine adapted to handle a large number of trays in a short period of time, and to clean the trays more thoroughly than could be done by hand. It is particularly proposed to utilize for this purpose rotary brushes engaging an advancing tray from opposite sides for thoroughly cleaning the same, and to provide in addition thereto means allowing individual trays to be taken from a stack by the machine itself and to be advanced into the proper position for the engagement with the brushes without the assistance of an attendant, so that the only attendance necessary is the stacking up of the trays and the removal of the cleaned trays.

The preferred form of my machine is illustrated in the accompanying drawing in which Figure 1 shows a side view of the same; Figure 2 a top plan view thereof, Figure 3 an end view as viewed from the left hand side of Figure 1; and Figure 4 a perspective detail view of a single tray.

While I have shown only the preferred form of the invention it should be understood that various changes or modifications may be made within the scope of the claims hereto attached without departing from the spirit of the invention.

A horizontal frame (1) consisting preferably of longitudinal channel irons (2) and transverse channel irons (3) is supported on the legs (4). Two parallel tracks (5) and (6) are disposed on either side of the horizontal frame and are arranged to form grooves through which two conveyor chains (7) and (8) are allowed to travel. The chains pass over sprocket wheels (9) and (11) mounted on the shafts (12) disposed in the front and rear end of the frame respectively. One of the shafts is preferably made adjustable for the purpose of regulating the tension on the chains, and is supported in

sliding boxes (13) adapted to be adjusted in their position by means of the threaded member (14) passing through a stationary lug (16) extending laterally from the horizontal frame.

Rotary motion is imparted to one of the shafts (12) to drive the conveyor chains by means of the chain (17) passing over a sprocket (18) on the shaft and over a sprocket (19) on a shaft (21) which latter shaft receives its rotary motion through an intermediate gear wheel (22) from the shaft (23) mounted vertically above the shaft (21). The shaft (23) is connected to the source of power, as for instance the motor (24), by means of the belt (26) and the gear 22 is carried on a stub shaft 22' projecting from a frame extension 2' and meshing gears 23' and 21' respectively secured to shafts 23 and 21.

The two shafts (21) and (23) have cylindrical rotary brushes (25) and 25' respectively mounted thereon, which brushes are adapted to engage a tray passing over the horizontal frame from opposite sides for the purpose of cleaning the same the lower brush being short enough to project upwardly between the two sets of tracks so as to engage the under side of a tray passing along the tracks. Both of the shafts 23 and 21 are preferably supported in sliding boxes (27) adapted to be adjusted in their respective supporting frames (28) by means of screws (29). A third cylindrical brush (31) is supported on a shaft (32) rearwardly of the brush on the shaft (23). This latter brush (31) is preferably made of somewhat finer material than the two first brushes so as to be adapted to improve on the work done by the first pair of brushes, and is revolved through means of a gear 32' secured to the brush shaft 32 receiving power from gear 23' through two idler gears 44 and 43 respectively mounted on stub shafts 46 and 45 projecting from the frame extension 2'.

At the rear end of the frame a structure (33) is arranged for the purpose of allowing a stack of trays to be properly arranged and to be maintained in their proper relation while single trays are successively withdrawn from the bottom thereof. The structure consists of a longitudinal wall (34) disposed on one of the longitudinal frame members, and a transverse wall (36) which latter is supported on standards (37) and

leaves an open space underneath the same as shown at (38), through which open space the lowermost tray of the stack may be pushed forward.

One form of tray commonly used in the fruit industry is shown in perspective in Figure 4 and comprises a plurality of boards (39) arranged in parallel relation and nailed to two end cleats (41). These trays are usually made of standard size, two sizes being ordinarily provided, one small size for the handling of raisins, apricots and the like, and a larger size for the handling of prunes. My machine is particularly designed to be used in connection with the smaller trays, but may be easily adapted to be used for the cleaning of the larger trays.

When these trays are stacked for the purpose of storing them away for the winter, it is customary to stack them in the manner shown in Figure 3. Instead of placing the trays one on the other in parallel relation with all the cleats on each side in a single line, the trays are stacked so that one cleat of the second tray projects over the corresponding cleat of the first tray, while the cleat on the opposite side of the third tray projects over the corresponding cleat on the second tray, so that the cleats of alternate trays are in a line while the cleats on the other trays form a different line on each side. This arrangement is used for the purpose of saving space.

My machine is designed to allow the customary method of stacking to be used, so that the operator may lift half a dozen or eight trays at a time from a stack or from a vehicle having a plurality of stacks mounted thereon and drop them into the structure (33) without re-arranging the same, taking pains, however, to push the trays against the wall (34). Due to the fact that two chains and two tracks are used on each side, it will be noted that each line of cleats is vertically above one of the chains. The chains 7 and 8 are provided with pushers (42) arranged alternately on the two chains in such a manner that after the pushers of the two left hand chains have pushed the lowermost tray from underneath the stack on account of alining with its cleats 41 as shown in Figure 3, a second pair of pushers disposed on the right hand chains engages with the cleats of the next succeeding tray and pushes the latter from underneath the stack. Each tray is thus pushed forwardly and advanced by means of the pushers on the chains to the other end of the machine, the chains 7 carrying every other tray and

the chains 8 the intermediate trays. While thus advancing, a tray has to pass between the two brushes (25) which being made of stiff material, preferably steel, scrape up and loosen any sticky material adhering to the tray. The second brush (31), which is preferably made somewhat finer, gives to the tray a second cleaning and insures perfect results.

It will be seen that trays can be handled very rapidly by the use of this machine. Only one operator is required to place the trays and to stack them within the structure (33) when the chains with their pushers will advance the lowermost trays one after the other, take them to the brushes to be cleaned and then deliver the same at the other end of the machine, from where they may be removed by the same operator.

I claim:

1. Means for successively separating individual trays from a stack of trays having side cleats thereon and piled with the cleats of successive trays arranged in staggered relation comprising two chains passing under either side of the stack arranged to correspond to the staggered cleats with pushers on the chains arranged for alternately engaging the cleats of the lowermost tray and for pushing the same forwardly whereby one chain carries one tray and the other chain carries the succeeding tray.

2. In a tray cleaning device, a horizontal frame, longitudinal tracks disposed thereon, a structure mounted on one end of the frame allowing a stack of trays to be placed thereagainst so as to maintain a prearranged relation, endless chains passing inside of the tracks having means associated therewith for successively pushing the lowermost tray from the stack and for advancing the same.

3. In a tray cleaning device, a horizontal frame, longitudinal tracks disposed thereon, a structure mounted on one end of the frame allowing a stack of trays to be placed thereagainst so as to maintain a prearranged relation, endless chains passing inside of the tracks having means associated therewith for successively pushing the lowermost tray from the stack and for advancing the same.

4. In a tray cleaning device, means for successively feeding trays from a stack of trays, said means comprising a pair of parallel conveyor elements adapted to alternately advance a tray from the stack, whereby a tray is carried along by one element and the next tray by the other element.

DALLAS H. GRAY.