

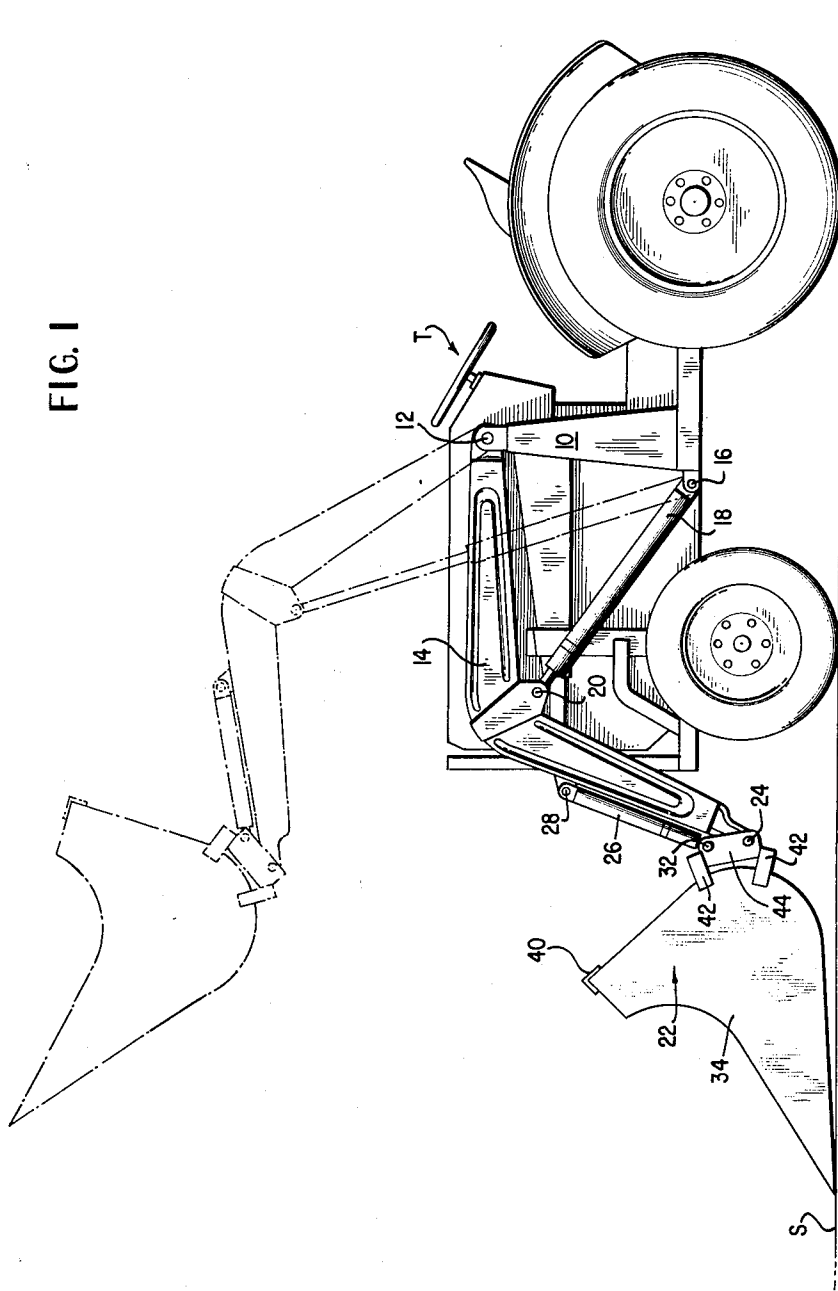
June 30, 1964

A. ROLFES  
FRONT END LOADER SCOOP FOR HANDLING POTATOES  
AND THE LIKE IN THE BULK

3,139,201

Filed May 28, 1962

2 Sheets-Sheet 1



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FIG. 2

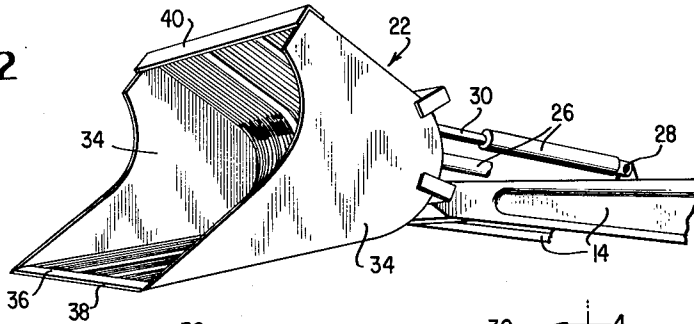


FIG. 3

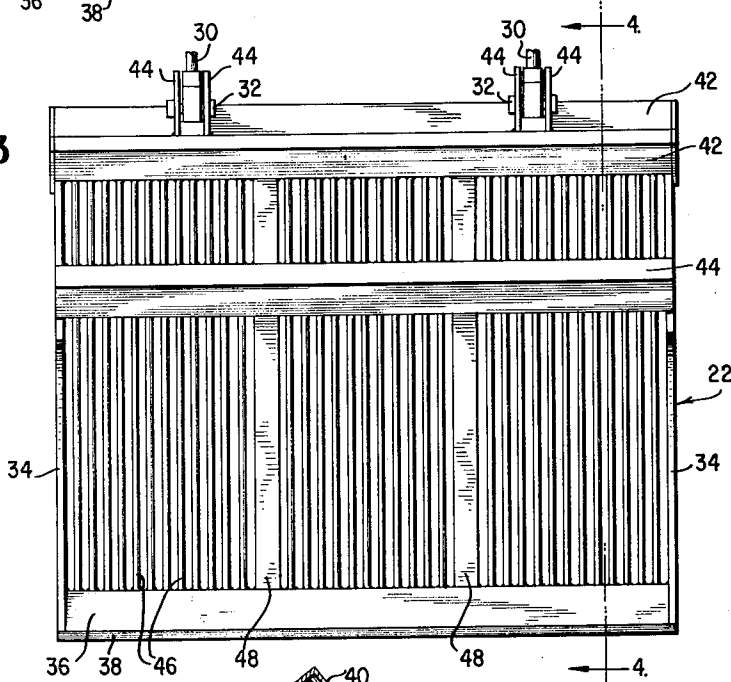
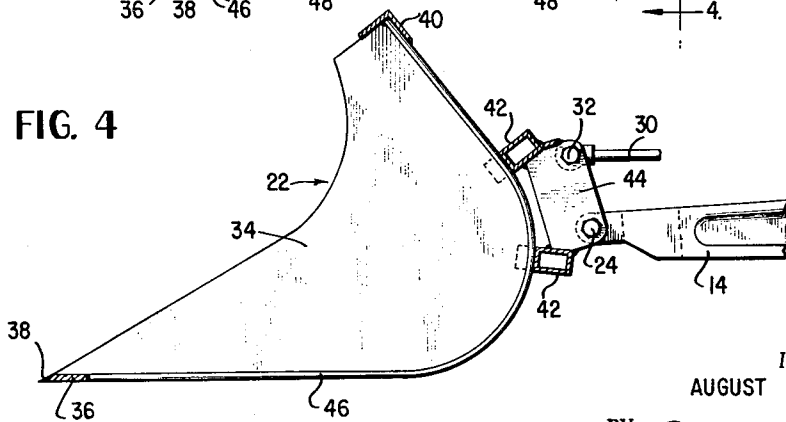


FIG. 4



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**3,139,201**  
**FRONT END LOADER SCOOP FOR HANDLING**  
**POTATOES AND THE LIKE IN THE BULK**

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2 Claims. (Cl. 214-140)

The present invention relates to a front end loader for tractors and more particularly to such a loader and especially to a scoop therefor, specifically adapted for handling in the bulk perishable articles such as potatoes.

As potatoes are dug or harvested, they are hauled in from the field and disposed in piles under a shed which usually is provided with a level floor normally formed of concrete. In due course, these potatoes are loaded from the storage piles into trucks which carry them to the processing plant for final cleaning, grading and bagging. The trucks hold an average load of about 300 bushels, and the potatoes are loaded into the trucks by hand shoveling from the pile into an elevator conveyor that deposits them in the trucks. The hand shoveling of the potatoes from the pile into the elevator is an extremely arduous job and even with the best of labor, it requires about three man-hours to load a truck. Actually, the labor costs are greater, however, because the loaders work in three-man crews with two men shoveling and one man resting alternately, so that three working hours require four and one-half pay hours.

There are few workers who are able to continually shovel potatoes all day long, even with the alternate rest periods, and in an effort to speed up operations, various mechanical loaders have been tried but rejected because of excessive damage to the potatoes. For example, with the ordinary tractor front end loader, it has been found that the potatoes are bruised by engagement with the metal plates of the loader bucket and cut by bolt heads, reinforcing straps or the like so that the loss in potatoes is greater than the saving in labor. One other difficulty with the usual front end loader is that the bucket is retained by a latch which, when released, dumps the entire contents of the bucket simultaneously so that the potatoes are dropped into the truck with excessive force both against the truck and upon each other.

Having in mind the defects of the prior art apparatus, it is the principal object of the present invention to provide a front end loader for tractors and scoop therefor that is especially adapted for handling potatoes without damaging and bruising the potatoes, and which has simplicity of design, economy of construction and efficiency in operation.

The novel features that are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in connection with the accompanying drawings, wherein like reference characters indicate like parts throughout the several figures and in which:

FIG. 1 is a side view in elevation of a tractor mounted front end potato loader in accordance with the present invention;

FIG. 2 is a view in perspective of the loader bucket in an elevated, dumping position;

FIG. 3 is a top plan view of the bucket, and

FIG. 4 is a cross-sectional view corresponding to line 4-4 of FIG. 3.

Referring now to the drawings in detail, specifically to FIG. 1, a loader in accordance with the present invention is shown as mounted on a standard farm type tractor

T which is provided with a frame 10 on which is mounted by pivots 12 the front loader support arms 14, and by pivots 16 the fluid operated jacks 18 which are connected to the arms 14 by pivots 20 for raising and lowering the arms. As is the usual or standard practice, there is an arm 14 on each side of the tractor, as indicated in FIG. 2, and also a jack 18 on each side of the tractor and connected to the respective arm.

A scoop 22 is mounted by pivot means 24 on the free ends of the arms 14, and in the present instance, the scoop 22 is also connected to the arms 14 by a pair of jacks 26 which are mounted by pivot means 28 on the respective arms 14, and have piston rods 30 connected by pivot means 32 to the scoop 22. The pivot means 32 are on an axis spaced from and parallel to the axis of the scoop supporting pivot means 24 so that the jacks 26 can operate to swing the scoop 22 on the pivot means 24. The jacks 26 are double acting fluid operated jacks. Preferably the jacks 18 are also double acting, although it is not absolutely necessary that the latter jacks be of this character. Preferably, both sets of jacks 18 and 26 are hydraulically actuated and may be operated by the standard hydraulic power system of the tractor, the only difference from the usual loader connection being the necessity for two hose lines to each jack and separate control valves for each set of jacks but, as such connections and valves are well-known per se, detailed disclosure is unnecessary.

The scoop 22 is of a unique construction providing decided advantages in the handling of potatoes and comprises two like end plates 34 of a generally arcuate or crescentlike shape, but having substantially straight bottom edges with the front edges of the end plates tapering toward the bottom edges to a forward point. The rear edges of said plates 34 curve upwardly to a squared or truncated upper end. Connecting the end plates 34 at the front end is a crossplate 36, the front edge 38 of which is beveled to the bottom leading edge. An angle iron 40 connects the end plates 34 at the upper end or corner and two spaced rectangular crossbeams 42 connect the end plates 34 at the curved rear edges so that the bucket frame is sturdy and rigid.

Two pairs of spaced, vertically disposed plates 44 are rigidly fixed perpendicularly to the crossbeams 42 and the pivoting mountings 24 and 32 are carried by the plates 44. The main body of the scoop is formed of a plurality of parallel strips including rods 46 of circular cross section and shaped to conform to the outline of the bottom and rear edges of the end plates 34 and spaced across the entire width of the scoop 22 except for flat bars 48 occasionally interposed between the rods for reinforcing purposes and also conforming to the shape of the rods.

The forward ends of the rods 46 and bars 48 are rigidly fixed to the rear edge of the front crossplate 36, and the upper ends of the rods and bars are welded to the upper cross angle 40 while intermediate their length, the rods and bars are welded to the crossbeams 42. In actual practice, it has been found that one-half inch thick steel for the end plates 34 and front crossplate 36 is entirely suitable and the rods 46 are of one-half inch diameter and spaced on one and one-quarter inch centers leaving a space of three-quarters inch therebetween. The brace bars 48 are of one-half by 2 inch steel bar stock. Preferably, the corner edges of the brace straps or bars 48 are beveled or rounded to eliminate sharp edges.

Stop means are provided for limiting the pivotal retraction of the scoop 22 about the pivotal support axis 24 relative to the arms 14 by the hydraulic jacks 26 so that when the piston rods 30 of the jacks 26 are fully retracted and the arms 14 are fully lowered, the front edge of the

crossplate 36 will engage the ground or floor surface but the rear portion of the bottom of the scoop will be elevated from the plane of the ground or floor surface, as shown in FIG. 1.

Conveniently, such stop means may be constituted by the ends of the cylinders of the jacks 26 abutting the support plates 44, or the relative positioning of said jacks so that the bucket has the desired position when the piston rods 30 are fully retracted and the mountings on the rods about the cylinder ends. In an arrangement that has proved highly successful, the rear portion of the bottom of the scoop is elevated in the neighborhood of one and one-half inches with the scoop having a bottom surface of approximately two feet in depth.

With the front edge of the scoop so positioned, it necessarily slides under the piled potatoes and precludes any possibility of the front edge 38 of the crossplate 36 from being slightly elevated and either cutting into or riding up over the bottom layer of potatoes. This is also one reason that the lifting jacks 18 preferably are of the double acting variety so that the scoop may be positively maintained in its lowest position rather than merely seeking its lowest position due to gravity.

In the operation of the present front end loader, the jacks 26 are retracted to their limit and the jacks 18 are also contracted until the front edge 38 of the scoop 22 engages the supporting surface S, as shown in full line in FIG. 1. The operator then drives the tractor T forward to push the scoop 22 beneath a pile of potatoes and when the scoop is filled, he actuates the lifting jacks 18 to raise the arms 14 and lift the scoop 22 with its load of potatoes to the phantom line position in FIG. 1.

The operator then maneuvers the tractor T to the truck to be loaded and when the scoop 22 is disposed over the adjacent edge of the truck body, the tractor operator actuates the scoop control jacks 26 to gradually extend their piston rods 30 and slowly tilt the scoop 22 so that the potatoes gradually flow from the scoop into the truck and are not dumped en masse. When the scoop is completely empty, the jacks 26 are then retracted and the operator returns to the pile of potatoes for another load.

The spaced rod construction of the bottom and back walls of the scoop have the advantage not only of avoiding damage to the potatoes but also in both loading and more particularly unloading the potatoes from the scoop, the potatoes within the scoop are visible and the operator can better control the tilting of the scoop. A five-foot wide scoop of the present construction holds approximately twelve bushels of potatoes and can load a three hundred bushel truck within less than half an hour with a minimum amount of effort. A tractor operator can spend a full day loading without undue fatigue as compared to manual loading in three man teams to alternately spell each other. Thus, there is a great saving in the potatoes themselves from less damage in handling as well as in time and labor costs.

Although a certain specific embodiment of the invention has been shown and described, it is obvious that many modifications thereof are possible. The invention, therefore, is not to be restricted except insofar as is necessitated by the prior art and by the spirit of the appended claims.

That which is claimed is:

1. In a tractor mounted front end loader, especially for handling in the bulk perishable articles such as potatoes, of the type including a scoop pivotally supported by pivotally mounted arms which are moved up and down by power means and carry means for controlling the pivotal movement of said scoop, the improvements comprising said scoop controlling means including double acting fluid operated jacks pivotally mounted on said arms and

pivotally connected to said scoop on an axis spaced from the pivotal support axis of said scoop on said arms for positively controlling the speed and angle of pivoting of said scoop relative to said arms, said controlling means also including stop means in the form of abutments on said scoop for engagement with said jacks to limit retraction of said jacks and fix the angle of said scoop relative to said arms so that when said arms are fully lowered the front bottom edge of said scoop engages the ground surface but the rear of the bottom of the scoop is elevated slightly from the plane of such ground surface, and said scoop comprising a pair of end plates of like crescent-like shape with elongated flat bottom edges terminating in pointed front ends and having curved rear edges terminating in squared upper ends, a front crossplate connecting said end plates at the pointed front ends thereof and having a beveled front edge substantially contiguous with the upper edges of said front ends, an angle bar connecting the squared upper ends of said end plates, a pair of spaced crossbeams connecting the rear curved edges of said end plates and generally parallel to said front crossplate and said angle bar, spaced support members fixed to and extending perpendicularly of said crossbeams and having pivotal connections with said arms and said second mentioned jacks, and a plurality of strips conforming to the shape of the bottom and rear edges of said end plates and extending from said front crossplate to said top angle bar and being rigidly secured thereto and to said crossbeams, said strips being parallelly spaced from each other and including rods of circular cross section with at least one flat reinforcing bar interposed therebetween, the forward ends of said strips being secured to the rear edge of said front crossplate and coplanar with said plate.

2. A scoop for a tractor mounted front end loader, especially for handling in the bulk perishable articles such as potatoes, comprising a pair of end plates of like crescent-like shape with elongated flat bottom edges terminating in pointed front ends and having curved rear edges terminating in squared upper ends, a front crossplate connecting said end plates at the pointed front ends thereof having a front edge beveled to a bottom leading edge, an angle iron bar connecting the upper ends of said end plates, a pair of spaced crossbeams connecting the rear curved edges of said end plates and generally parallel to said front crossplate and said bar, spaced support members fixed to and extending perpendicularly of said crossbeams, vertically spaced pivotal connection means on said support members for mounting said scoop on support means so as to tilt in a plane perpendicular to said crossbeams, and a plurality of strips conforming to the shape of the bottom and rear edges of said end plates and extending from said front crossplate to said top bar and being rigidly secured thereto and to said crossbeams, said strips being parallelly spaced from each other and including rods of circular cross section, the forward ends of said strips being secured to the rear edge of said front crossplate and coplanar with said plate, said spaced strips including at least one flat reinforcing bar interposed between said rods, the edges of said reinforcing bar and said end plates being rounded to preclude cutting of the articles to be handled.

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