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MATERIAL HANDLING ATTACHMENT FOR FRONT END LOADERS ON TRACTORS

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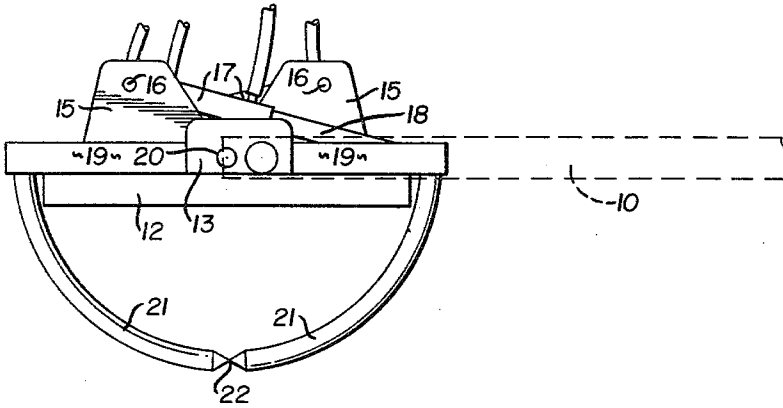


FIG. 1

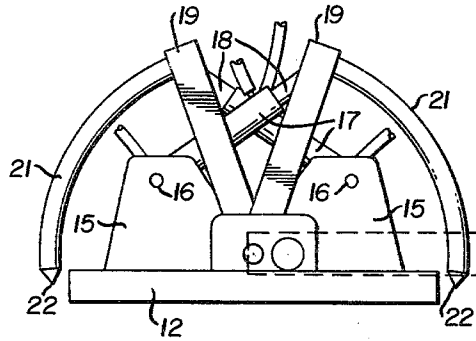


FIG. 2

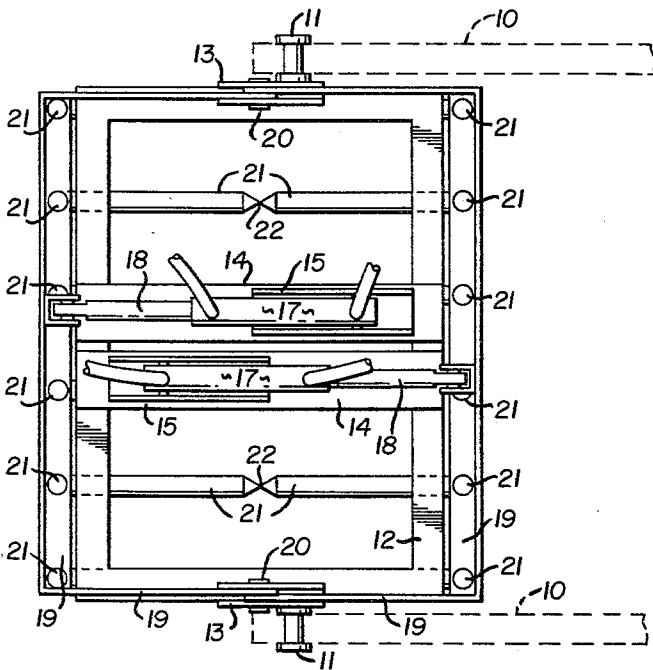


FIG. 3

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MATERIAL HANDLING ATTACHMENT FOR FRONT END LOADERS ON TRACTORS

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3 Claims. (Cl. 294-38)

This invention relates to a material handling device and more particularly to a device attachable to the front end loader arrangements commonly employed with tractors.

The principal object of the invention is the provision of a material handling device having material engaging arms movable in a common circular path based on a common axis.

A further object of the invention is the provision of a material handling device which will operate to move the material engaging portions thereof into or in under the material to be handled independently of any other motion or action.

A still further object of the invention is the provision of a material handling device which may be readily attached to and operated in conjunction with a front end loader attachment on a tractor.

A still further object of the invention is the provision of a material handling device in which the material engaging portions of the device move in a common circular path around and about the pivoting and actuating means thereof.

A still further object of the invention is the provision of a material handling device that is adaptable to all types of front end loader constructions and farm or industrial units utilized therewith.

A still further object of the invention is the provision of a material handling device in which the material engaging portions move on a common circular path relative to a supporting frame structure arranged to act as a stripper in disengaging material from the material engaging portions of the device.

The material handling device disclosed herein comprises an improvement in the art relating to such devices and particularly as applied to front end loaders used with industrial or farm tractors. A number of various front end loader devices are known in the art and such devices include various arrangements for engaging and holding material to be handled. Generally, such devices are operable with a scoop-like action wherein the device is pushed in under or downwardly into the material to be handled by the action and motion of the tractor and/or the front end loader. In the present disclosure, the material handling device is merely carried by the front end loader which in turn is carried by the tractor and the device is capable of engaging beneath material to be picked up, or moving downwardly into a pile of material to be moved with the operating action and motion originating in and confined to the material handling device, the same being merely positioned in appropriate location for operation by the tractor and the front end loader.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being the intention to cover all changes and modifications of the example of the invention herein chosen for purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

The invention is illustrated in the accompanying drawing, wherein:

FIGURE 1 is a side elevation of the material handling

device with broken lines illustrating a portion of a front end loader.

FIGURE 2 is a side elevation of the material handling device showing the material engaging arms in retracted position.

FIGURE 3 is a top plan view of the material handling device with broken lines showing portions of a front end loader.

By referring to the drawings and FIGURE 3 in particular, it will be seen that spaced parallel arms 10, 10 of a front end loader are shown in broken line representation as they would extend forwardly of an industrial or farm tractor (not shown). The ends of the arms 10, 10 are pivoted by pivot members 11, 11 to a rectangular frame 12 and more particularly to upstanding mounting brackets 13, 13 thereon. As illustrated, the frame 12 with its mounting brackets 13 and sidewardly extending pivot members 11 is directly supported in pivotal relation on the arms 10. However, it will occur to those skilled in the art that if desired hydraulic piston or cylinder assemblies or other motion imparting devices may be connected between the frame 12 and the arms 10 so as to provide means for controlling the relative position of the frame 12 and the arms 10. As such means are not essential to the operation of the material handling device herein disclosed, they are not otherwise referred to or illustrated herein.

The rectangular frame 12 has a pair of transverse members 14, 14 thereon inwardly from the ends thereof and each of these transverse members 14, 14 thereon inwardly from the ends thereof and each of these transverse members 14 has a pair of upwardly flanged brackets 15, 15 thereon which serve to locate pivots pins 16, 16 which also engage hydraulic cylinders 17, 17. Extensible pistons 18, 18 telescopically engage the hydraulic cylinders 17, 17 and are pivotally attached at their outermost ends to oppositely disposed U-shaped sub-frame members 19, 19. The arms of the U-shaped sub-frame members 19, 19 are pivotally attached adjacent their ends to the brackets 13 by pivots 20, 20.

It will be observed by referring to FIGURE 3 of the drawings that the brackets 13, 13 have spaced upstanding flanges and that the ends of the arms of the sub-frame members 19, 19 are positioned between these upstanding flanges which therefore act as guides with the pivots 20, 20 extending through the upstanding flanges of the bracket 13 and the sub-frame members 19, 19. It will further be seen by referring to any of the figures of the drawing that the pivots 20 are on the center line between the U-shaped sub-frame members 19, 19 so that when the sub-frame members 19, 19 are moved by the hydraulic cylinders 17, 17 and pistons 18, 18 as seen in FIGURES 1 and 2 of the drawings the outer portions of the sub-frame members 19, 19 will travel on a common circular path, the axis of which bisects the pivots 20. Each of the sub-frame members 19, 19 has a plurality of longitudinally spaced downwardly depending arcuate elongated teeth 21 thereon.

In the embodiment illustrated, six such teeth are secured to each of the sub-frame members 19, 19 in oppositely disposed alignment so that the lower outermost ends of the teeth 21 which are pointed as at 22 touch one another when the teeth 21 are in lowermost position as seen in FIGURES 1 and 3 of the drawings.

The hydraulic cylinders 17 are double acting cylinders and a source of hydraulic fluid under pressure such as that commonly provided by farm or industrial power units on tractors is connected through suitable control valves (not shown) with the cylinders 17 as will be readily understood by those skilled in the art. The pivot members 11 may be of the readily detachable type and quick connect couplings may be supplied in the hydraulic

hose lines which provide the actuating power for the device so that the material handling device may be readily attached to or removed from the front end loader on a farm or industrial tractor.

It will thus be seen that the plurality of opposed arcuate teeth 21 are so formed and arranged that they lie on a common circular pattern having a common axis and are therefore operable on a common radius so that when the device, in the position shown in FIGURE 2, is positioned by the tractor and front end loader arms 10 on or over a pile of material to be handled and the hydraulic cylinders 17 actuated, the sub-frame members 19, 19 will move from the position shown in FIGURE 2 to the position shown in FIGURES 1 and 3 which action will cause the teeth 21 to penetrate the material to be handled without any other action or motion being imparted to the device by the tractor or front end loader.

It will thus be seen that once the teeth 21 has moved into position shown in FIGURES 1 and 3, the device may be lifted by the front end loader arms 10 and moved by the tractor to a point of disposal whereupon the reverse actuation of the hydraulic cylinders 17 will move the sub-frame members 19, 19 and teeth 21 upwardly to the position shown in FIGURE 2 with a self-cleaning or stripping action occurring as the teeth move past the sides of the rectangular frame 12 and which may be modified by providing apertured portions through which the teeth 21 move if desired.

It will be seen that when the teeth 21 and the sub-frame members 19, 19 are retracted as in FIGURE 2 of the drawings they form a protective enclosure about the hydraulic cylinders 17 and their mounting means and it will further be seen that in such position the device may be lowered to the ground or floor level and used as a scraper to push loose material into a pile to facilitate handling the same. The control valves (not shown) which control the operation of the hydraulic cylinders 17 are preferably individual so that one or the other of the sub-frame member 19 may be lowered and the device used in a grubbing action or in the loosening of soil, the necessary motion being provided by the tractor and the positioning of the device being controlled by the front end loader arms 10, 10.

It will thus be seen that a material handling device hav-

ing several unique characteristics has been disclosed, and having thus described our invention, what we claim is:

1. A material handling device for a front end loader attachment having horizontally spaced arms for raising and lowering such devices and comprising a horizontally disposed main frame having spaced end and side portions and a pair of oppositely disposed sub-frame members each of which is of U-shape and comprises an interconnecting member having perpendicular secondary arms at the ends thereof a plurality of spaced depending arcuate teeth on each of said interconnecting members, said arcuate teeth positioned on a common radius, said secondary arms of said sub-frame members being pivoted at their free ends to said main frame on the axis of said common radius and means on said main frame for imparting motion to said sub-frame members and secondary pivot means on said main frame for attaching the same to said arms of said loader attachment so as to be positioned therebetween.

2. The material handling device set forth in claim 1 and wherein the means for imparting motion to said sub-frame members and teeth comprise hydraulic piston and cylinder assemblies pivotally mounted on said main frame and engaging said sub-frames.

3. The material handling device set forth in claim 1 and wherein upwardly flanged brackets are attached to the ends of said main frame and the secondary arms of the U-shaped sub-frame members are pivotally secured to said brackets and wherein said secondary pivot means are located on said flanged brackets.

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