

[54] **DOZER BLADE ASSEMBLY FOR TRACTORS**
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[51] Int. Cl. **A01b 51/00**

[58] Field of Search 172/276, 801, 803, 805, 172/806, 273, 277, 274, 272; 37/42 R

[57] **ABSTRACT**

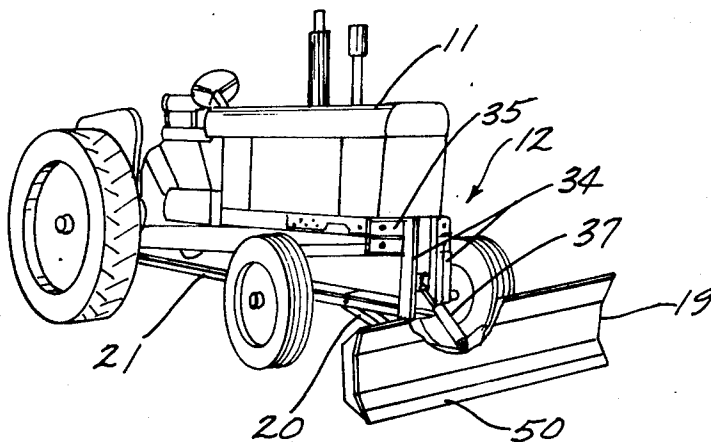
A dozer blade assembly for tractors including a pair of mounting brackets for attachment to a tractor frame, a push pole attachable to a tractor drawbar, a dozer blade pivotally connected to the push pole, a support member extending from the push pole to the mounting brackets, and eccentric positioning and mounting pins connecting the support member to the mounting brackets, the eccentric nature of the pins allowing for mounting to a variety of tractor frame sizes. Also disclosed are a telescoping push pole and a dozer blade formed of flat sections of material.

7 Claims, 10 Drawing Figures

[56] **References Cited**

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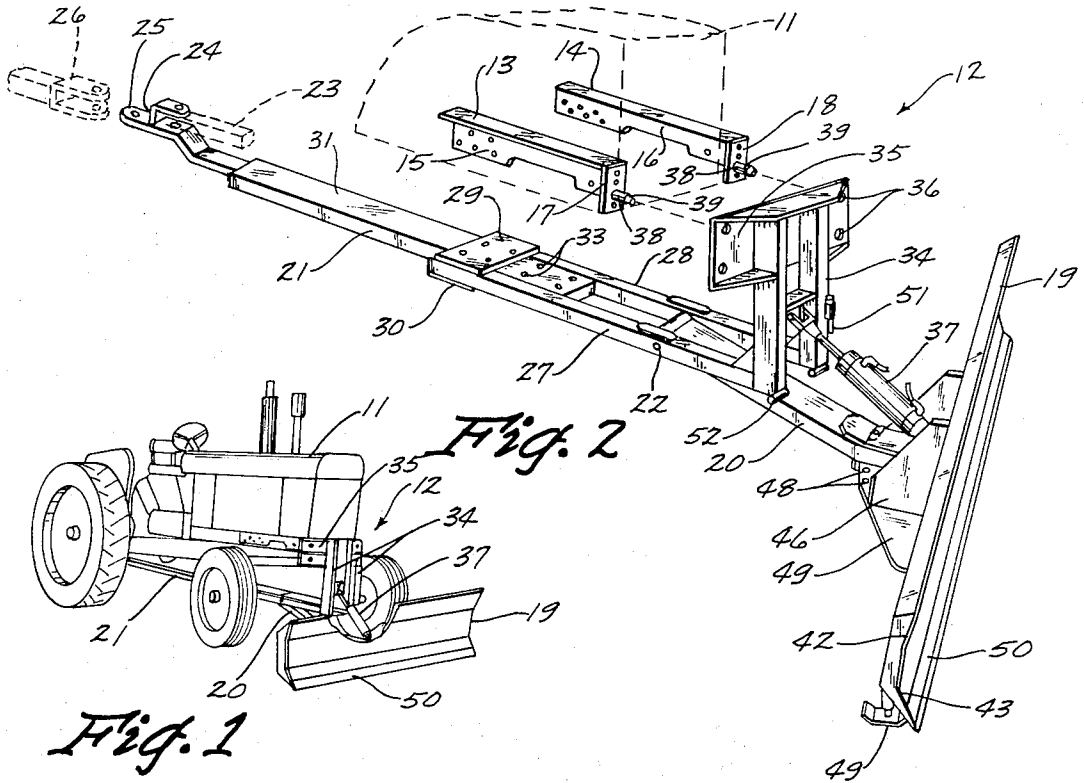


Fig. 1

Fig. 2

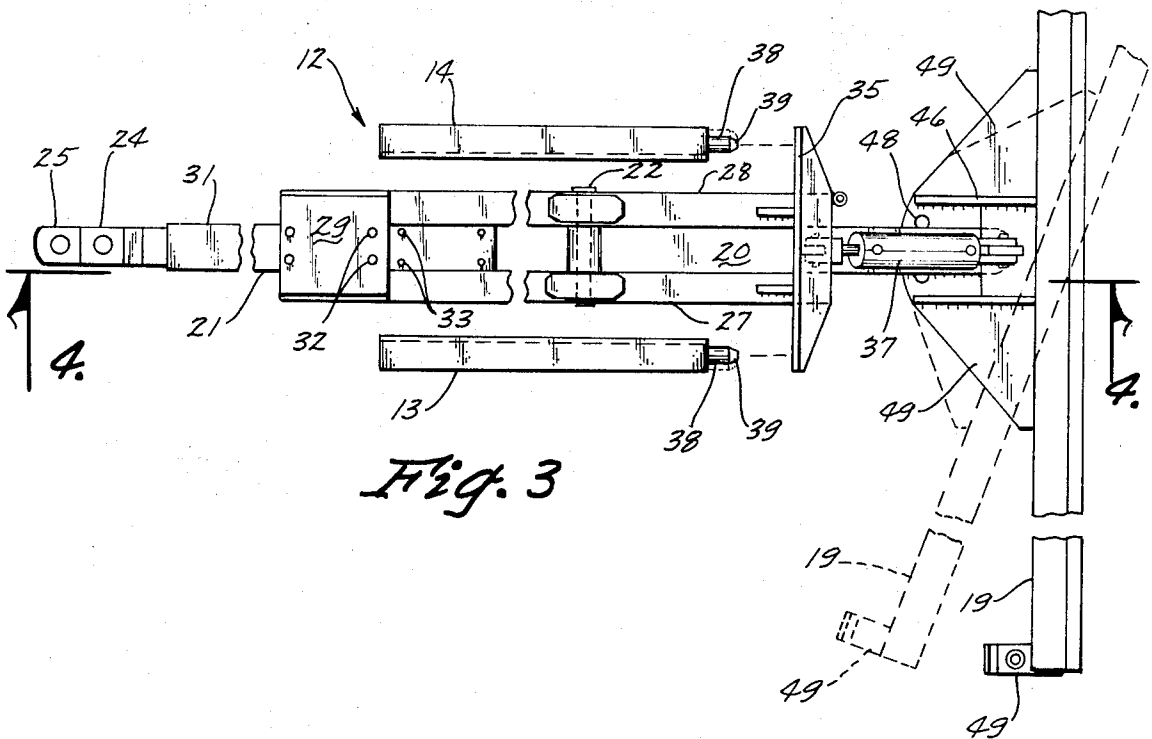


Fig. 3

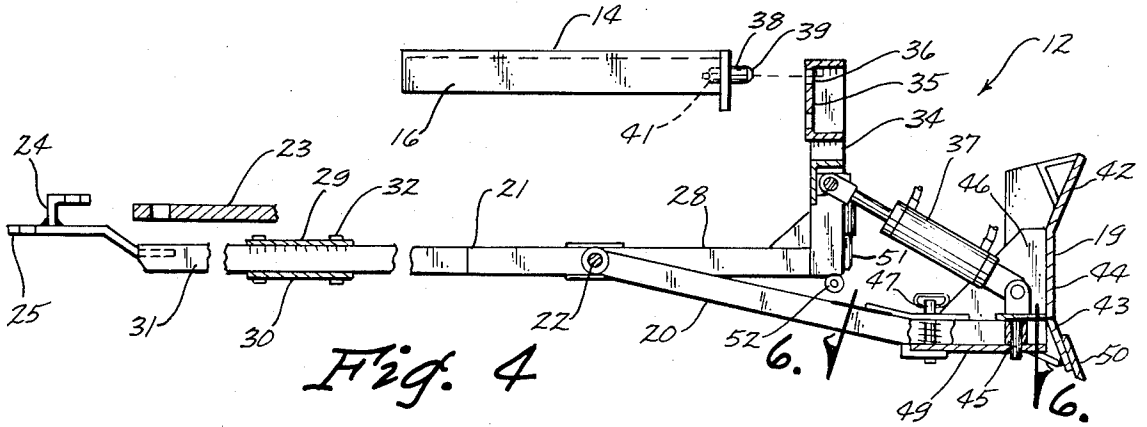


Fig. 4

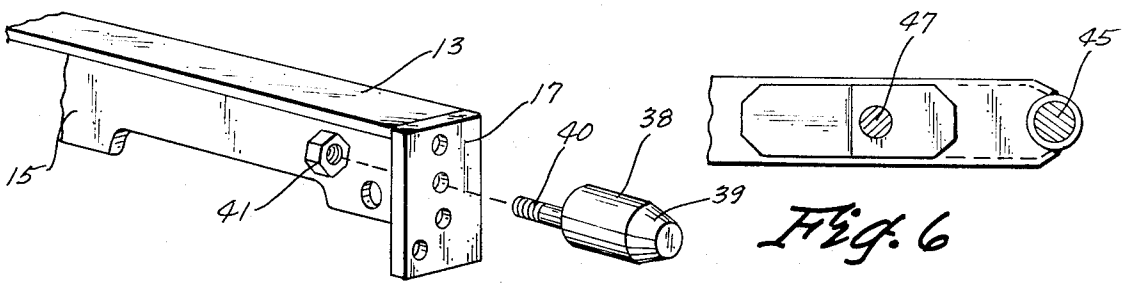


Fig. 5

Fig. 6

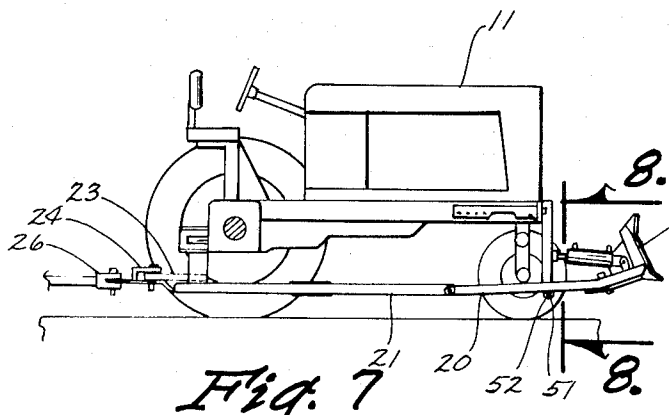


Fig. 7

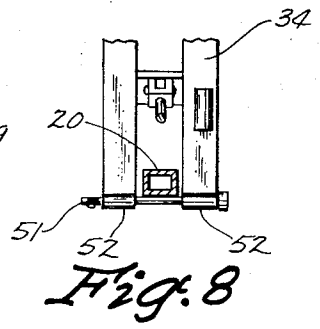


Fig. 8

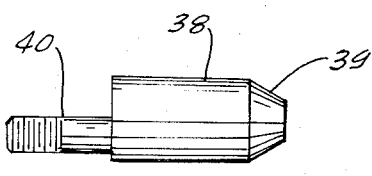


Fig. 9

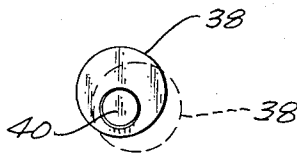


Fig. 10

DOZER BLADE ASSEMBLY FOR TRACTORS

BACKGROUND OF THE INVENTION

This invention relates to dozer blade assemblies for use with tractors and the like, and more particularly to a dozer blade assembly that is universally adapted for use on many different sizes and models of tractors.

Various types of dozer blade assemblies have been developed in recent years for use on farm tractors in such operations as grading, plowing snow, cleaning feedlots, and so forth. Most of these devices have had provision for mounting to various parts of the tractor, and generally have had adjustable blades operated by a hydraulic take-off from the tractor. A particularly desirable feature of a dozer blade assembly for tractors is that the blade be quickly and easily mountable and demountable, as it is generally not desired to have the blade assembly on the tractor except when the blade is being used.

Previously available blade assemblies for tractors, as exemplified by U.S. Pat. Nos. 2,979,839; 3,289,332; 3,441,091; 3,487,884; 3,548,956 and 3,565,181, have been quite satisfactory for most purposes. However, none of the previously available blade assemblies have been as easily mountable and demountable, or as universally useful on differing sizes and models of tractors, as the blade assembly of this invention.

SUMMARY OF THE INVENTION

According to the present invention, a dozer blade assembly is provided that universally fits a wide range of tractors and that can be quickly attached or detached by one man. Additionally, the dozer blade assembly of this invention operates through a push pole attached to the tractor drawbar, and the dozer blade is pivotally connected to the push pole under the tractor engine allowing for a longer arm and better action. The assembly according to the invention in its broader aspect includes mounting brackets attachable to a tractor frame, a push pole extending beneath the tractor frame and having a blade mounted on an arm pivoted to the push pole, and a support structure extending from the push pole to the mounting brackets and connected thereto by pins.

According to some more specific aspects of the invention, the push pole is adapted to be pinned to the drawbar of a tractor, and includes a telescoping feature to accommodate varying sizes and types of tractors. Also, a unique blade construction is provided. One particularly important feature of the invention includes the use of special eccentric mounting and positioning pins for attaching the support structure to the mounting brackets.

It is an object of this invention to provide a dozer blade assembly for tractors that is universally adaptable to a wide range of types and sizes of tractors.

It is a further object to provide a dozer blade assembly that can be quickly and easily attached to and removed from a tractor.

That these and other objects and advantages are obtained by the present invention will become apparent upon consideration of the following detailed description of a preferred embodiment thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view showing a tractor with the assembly of this invention attached thereto.

FIG. 2 is an enlarged perspective view illustrating the assembly according to this invention.

FIG. 3 is a top plan view thereof.

FIG. 4 is a side elevational view thereof.

FIG. 5 is an exploded perspective view of a mounting bracket and an eccentric mounting and positioning pin in accordance with one aspect of the invention.

FIG. 6 is an enlarged top plan view taken along the line 6—6 of FIG. 4.

FIG. 7 is a side elevational view of the assembly mounted on a tractor, with a part of the tractor cut away for clarity of illustration.

FIG. 8 is a cross-sectional view illustrating the operation of a transport pin in accordance with one aspect of the invention, the view taken along line 8—8 of FIG. 7.

FIG. 9 is a side elevational view of an eccentric mounting and positioning pin.

FIG. 10 is an end view of the pin of FIG. 9.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment of the invention will now be described by reference to the drawings. It will be apparent that in many instances modifications to and variations of the assembly as described could be made without departing from the true scope of the invention, of which the following is exemplary.

In FIG. 1, a typical farm tractor 11 is shown with a dozer blade assembly indicated generally as 12 mounted thereon.

The assembly 12 is shown more clearly in FIG. 2, and includes a pair of mounting brackets 13 and 14, which are identical except for being mirror images such that they can be bolted to opposite sides of a tractor frame. The brackets 13 and 14 include side members 15 and 16 respectively having a pattern of bolt holes therein designed to match the bolt hole pattern on all popular tractors. In addition, the brackets 13 and 14 include forward plates 17 and 18 respectively. The forward plates 17 and 18 also include a pattern of bolt holes (FIG. 5) which are vertically spaced one from another, and at least one of the bolt holes is displaced horizontally from the others as clearly seen in FIG. 5.

The frame widths of all the popular models of farm tractors are more or less standardized at about twenty inches. However, sufficient variation is found to require that a "universal" mounting bracket for tractor frames have some provision for adjustment to accommodate slight differences in tractor frame width. The manner in which this variation is accommodated according to one aspect of this invention will be described later.

The assembly of this invention includes dozer blade 19 connected to an arm 20 which in turn is pivotally connected to the forward end of a push pole 21 by a pin 22 extending therethrough (FIG. 3).

The push pole 21 extends to the rear of tractor 11 (FIG. 7) and is adapted to be pinned to the drawbar 23 of tractor 11 as best seen in FIG. 7. The rear of the push pole includes a yoke section 24 for connection to the tractor drawbar 23 and also includes a rear extension

25 which may be utilized as the tractor drawbar to pull additional equipment 26 as shown in FIG. 7.

The assembly of the invention can be fitted to tractors of different lengths due to a telescoping feature of the push pole 21 as will now be described. The forward end of the push pole 21 is formed of two spaced apart members 27 and 28 to which upper plate 29 and lower plate 30 (FIG. 4) are affixed. The rear section 31 of push pole 21 extends slidably into the opening formed by members 27 and 28 and upper and lower plates 29 and 30, and the proper length of push pole 21 for a given tractor model is obtained by bolts 32 (FIG. 4) extending through upper and lower plates 29 and 30 and through selected ones of a series of holes 33 in the forward end of rear section 31 of push pole 21.

A support member 34 is rigidly connected to the forward end of push pole 21, and includes a plate 35 having pin receiving holes 36 formed therein. A conventional hydraulic cylinder 37 extends from support member 34 to dozer blade connecting arm 20 (FIGS. 2-4) and is preferably powered by a hydraulic system (not shown) normally available on the tractor 11.

An important feature of this invention is the provision of specially designed eccentric mounting and positioning pins 38 illustrated in FIGS. 2-5 as connected to forward plates 17 and 18 and projecting into mounting and positioning holes 36 in plate 35. The unique design of the pins 38 is seen in FIGS. 9 and 10, showing a larger stabbing section 39 and a reduced fastening section 40 threaded for connection to nut 41 (FIG. 5). It will be apparent that some degree of variation of tractor frame size can be accommodated by selecting the proper hole in forward plates 17 and 18. However, maximum flexibility is achieved due to the eccentric pins 38. With the fastening section 40 of pin 38 loosely positioned in plate 17, it will be seen that rotation of the pin 38 in the hole in plate 17 will result in displacement of the centerline of the stabbing section 39 as best seen in FIG. 10. Also, it will be apparent that a slight vertical tilt of support member 34 can be accomplished by selective rotation of pins 38 such that the stabbing section 39 of one is in a higher position than the stabbing section of the other. This might be useful in instances of scraping or plowing a graded road surface or the like. However, the most important benefit from the eccentric pins is the flexibility in adapting to variations in tractor frame size.

The details of construction of the dozer blade 19 are best shown in FIGS. 2-4. It can be seen in FIG. 4 that the blade 19 is formed in flat sections with two bend lines giving forwardly extending upper section 42, forwardly extending lower section 43, and generally vertically extending section 44. This construction has been found to perform comparably with conventional rolled or curved blade structures, and can be formed without the necessity of large rolling equipment as required for a curved blade.

The dozer blade 19 can be angled in either direction, as shown by dotted lines in FIG. 3. This is accomplished by a pin 45 (FIG. 4) extending through the supporting structure 46 at the rear of dozer blade 19. A spring-loaded locking pin 47 extends through the connecting arm 20 into a selected one of several holes 48 in lower plate 49 of the blade supporting structure (FIG. 2 or 3). The blade 19 and supporting structure 46 are balanced such that one man can adjust the angle of the blade by pulling up on the spring-loaded pin 47, turning the

blade 19 until the desired hole 48 is aligned with the pin 47, and releasing the pin 47 allowing it to project into the hole 48, thereby locking the blade 19 at the desired angle.

A very important and desirable feature of this invention is the provision of a dozer blade assembly that can be attached to and removed from a tractor by one man in a matter of seconds. The procedure for attaching and removing the assembly will now be outlined.

The first step in attaching the assembly 12 to a tractor 11 is the bolting of mounting brackets 13 and 14 to the frame of tractor 11. The brackets 13 and 14 are normally left permanently in place on the tractor, such that this first step is only necessary initially. The eccentric pins 38 are then attached to plates 17 and 18 and rotated so that the spacing between pins 38 (FIG. 3) is adjusted to conform to the spacing of mounting holes in plate 35 of support member 34. The nuts 41 are then tightened on fastening section 40 of pins 38. The tractor 11 is then driven over the push pole 21 until the pins 38 are just short of plate 35. The hydraulic lines from the tractor hydraulic system are then connected to cylinder 37, and plate 35 is raised to align pin holes in plate 35 with pins 38 by extending hydraulic cylinder 37. The tractor 11 is then driven forward to stab pins 38 into the pin holes in plate 34. The blade 19 is then raised hydraulically such that the weight of the entire assembly is supported by pins 38. The operator then lifts the yoke or rear section of push pole 21 and swings it over drawbar 23 of tractor 11. The push pole is then pinned to drawbar 23, and the installation is complete. Note that the pins 38 do not have to be secured to plate 35 other than by the stabbing connection.

To remove the assembly, the above procedure is essentially reversed, such that the blade is raised, the drawbar pin is removed, the push pole is swung away from the drawbar and dropped to the ground, the blade is lowered hydraulically, the tractor is backed away from plate 35 to remove pins 38 therefrom, and the hoses are disconnected to complete the removal.

Conventional features such as skids 49 (FIGS. 2 and 3) and blade tip 50 (FIG. 4) are provided for the usual purposes.

FIGS. 7 and 8 illustrate still another feature of the invention. FIG. 7 shows the assembly in the transporting position, in which the blade arm 20 is raised, and held in the up position by a transport pin 51 inserted in eyes 52 on the supporting member 34 to maintain the blade in the raised position during transport of the tractor. In the event of hydraulic failure, the pin 51 would prevent the blade from falling, with possible resultant damage.

The preferred embodiment of the invention has been described in detail above. Such description is not intended to represent the only embodiment of the invention, and in many instances equivalent means and structure can be utilized within the true scope of the invention, which is to be defined by the appended claims.

I claim:

1. A dozer blade assembly for tractors comprising:
 - a pair of mounting brackets for attachment to a tractor frame;
 - a push pole adapted for attachment to a rear portion of a tractor;
 - an upstanding support member attached to the forward portion of the push pole and adapted to be

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connected to the mounting brackets by pin means;

at least one eccentric pin means connecting the mounting brackets to the support member;

a blade-supporting arm pivotally connected to the forward portion of the push pole;

blade means attached to the blade-supporting arm; and

powered means extending from the support member to the blade means for raising and lowering the blade means.

2. A dozer blade assembly as defined in claim 1 wherein the push pole includes at the rear thereof a yoke section for attachment to a tractor drawbar and a rear extension for attachment to additional equipment.

3. A dozer blade assembly as defined in claim 1 wherein the push pole includes a rear section and a forward section, said sections being telescopically positionable relative to each other to accommodate different tractor lengths.

4. A dozer blade assembly as defined in claim 1 in-

cluding transport pin receiving means at the lower portion of the support member, said means being adapted to receive a transport pin for supporting the blade-supporting arm when said arm is in a raised position.

5. A dozer blade assembly as defined in claim 1 where the blade means is pivotally connected to the blade supporting arm for selective side-to-side positioning, and including spring-biased pin means for fastening the blade to the blade-supporting arm in a selected position.

6. A dozer blade assembly as defined in claim 1 wherein the eccentric pin means connecting the mounting brackets to the support member comprises a stabbing section and a fastening section, the respective axial center lines of said sections being displaced relative to one another.

7. A dozer blade assembly as defined in claim 6 wherein two eccentric pin means are provided, the fastening sections are fastened to the mounting brackets by threaded means, and the stabbing sections project forwardly from the mounting brackets.

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