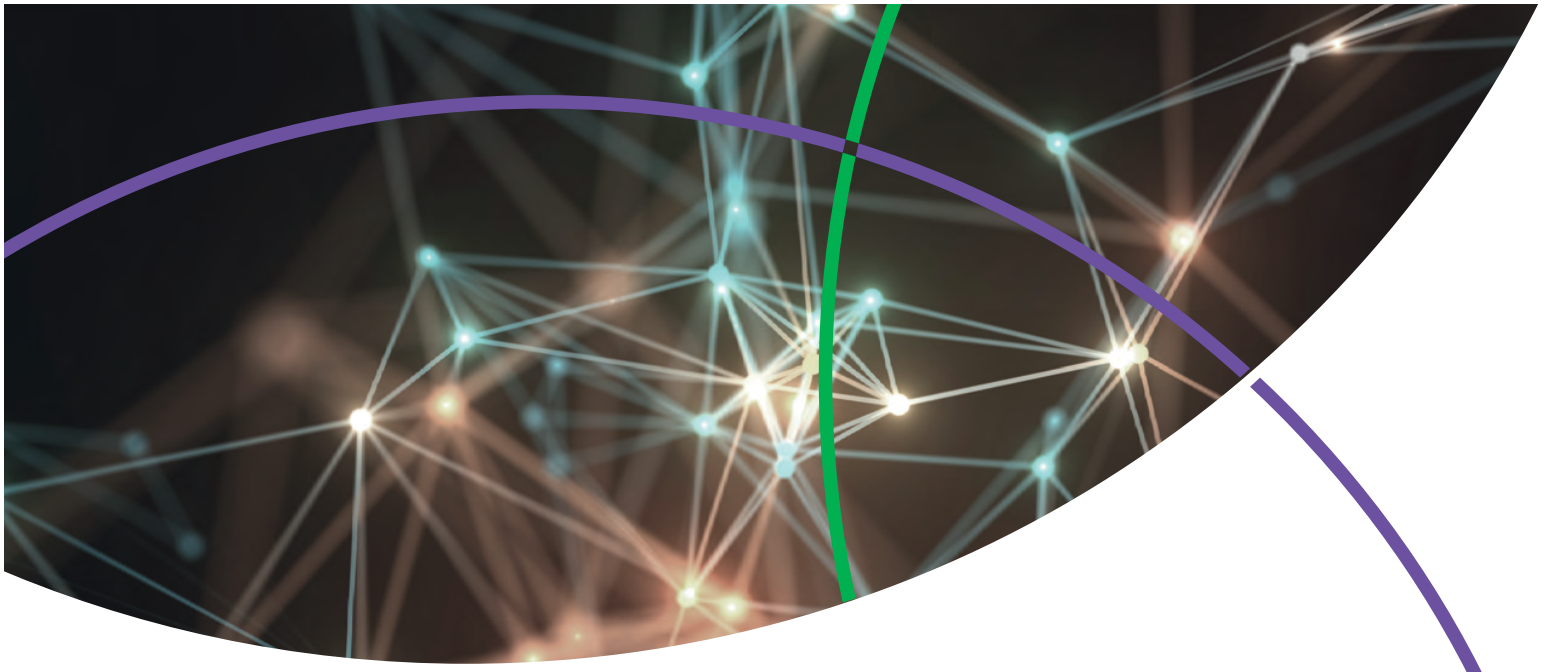


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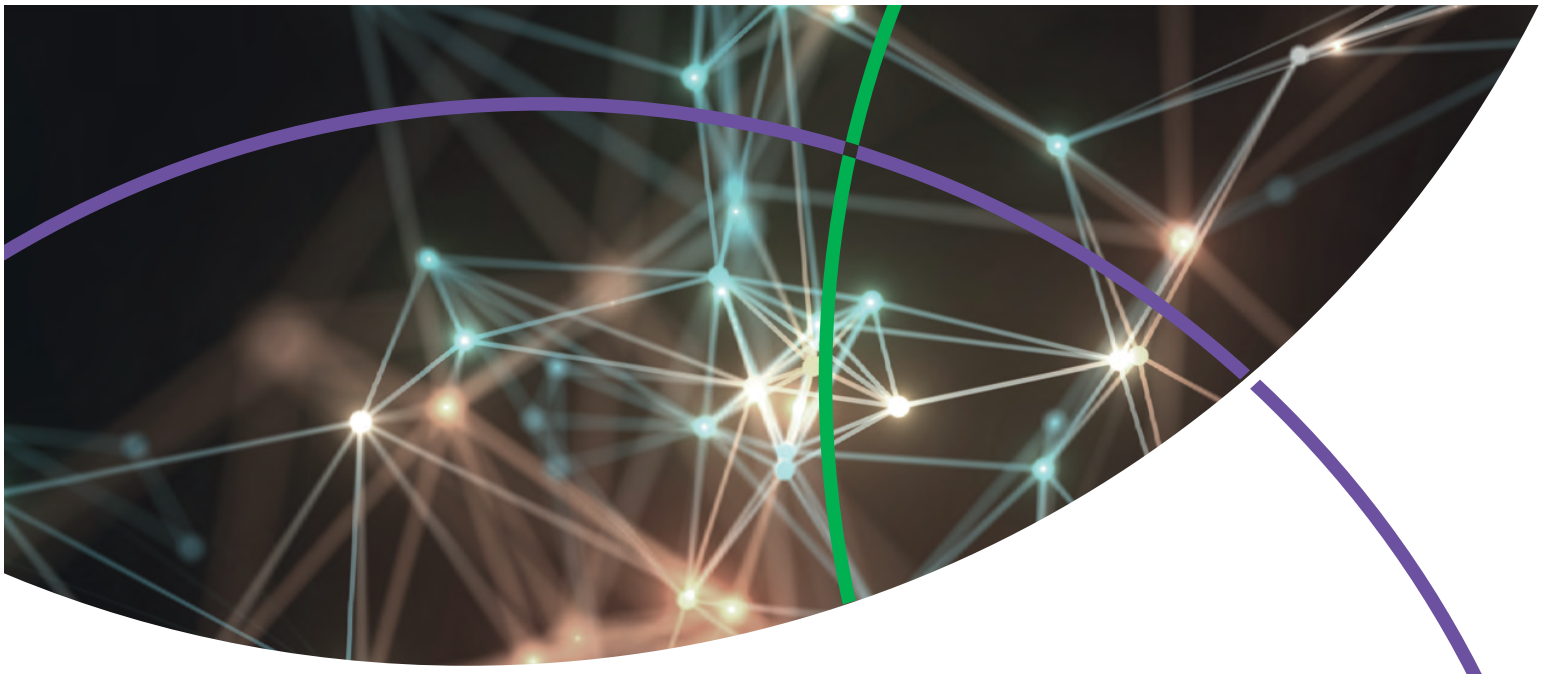
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FILE HISTORY

US 9,745,123

PATENT:	9,745,123
INVENTORS:	PETERSEN BRIAN JAMES SMITH DAVID RICHARD
TITLE:	Seed carrier with pivoting conveyor
APPLICATION NO:	US14606794A
FILED:	27 JAN 2015
ISSUED:	29 AUG 2017
COMPILED:	29 AUG 2024

9,745,123

Seed carrier with pivoting conveyor

Transaction History

Date	Transaction Description
01-27-2015	Entity Status Set To Undiscounted (Initial Default Setting or Status Change)
01-27-2015	Initial Exam Team nn
02-06-2015	Electronic Review
02-06-2015	Email Notification
02-06-2015	Email Notification
02-06-2015	Filing Receipt
02-06-2015	Notice Mailed--Application Incomplete--Filing Date Assigned
04-06-2015	Information Disclosure Statement considered
04-06-2015	Reference capture on IDS
04-06-2015	Information Disclosure Statement (IDS) Filed
04-06-2015	Patent Term Adjustment - Ready for Examination
04-06-2015	Payment of additional filing fee-Preexam
04-06-2015	Information Disclosure Statement (IDS) Filed
04-09-2015	Application Dispatched from OIPE
04-09-2015	FITF set to NO - revise initial setting
04-10-2015	Email Notification
04-10-2015	Email Notification
04-10-2015	Change in Power of Attorney (May Include Associate POA)
04-10-2015	Application Is Now Complete
04-10-2015	Filing Receipt - Updated
05-11-2015	Preliminary Amendment
05-11-2015	Preliminary Amendment
07-16-2015	PG-Pub Issue Notification
07-17-2015	Email Notification
08-31-2015	Application ready for PDX access by participating foreign offices
09-03-2015	Case Docketed to Examiner in GAU
01-09-2017	Non-Final Rejection
01-26-2017	Electronic Review
01-26-2017	Email Notification
01-26-2017	Mail Non-Final Rejection
04-26-2017	Response after Non-Final Action
04-26-2017	Electronic Information Disclosure Statement
04-26-2017	Information Disclosure Statement (IDS) Filed
05-03-2017	Date Forwarded to Examiner
06-26-2017	Information Disclosure Statement considered
07-03-2017	Notice of Allowance Data Verification Completed
07-06-2017	Mail Notice of Allowance
07-09-2017	Email Notification
07-10-2017	Electronic Review
07-13-2017	Issue Fee Payment Verified
07-13-2017	Issue Fee Payment Received
07-18-2017	Application Is Considered Ready for Issue
07-25-2017	Dispatch to FDC
08-09-2017	Issue Notification Mailed
08-10-2017	Email Notification
08-29-2017	Recordation of Patent Grant Mailed
08-29-2017	Patent Issue Date Used in PTA Calculation
02-18-2021	Payment of Maintenance Fee, 4th Year, Large Entity

Issue Classification	**Application/Control No.** 14606794	**Applicant(s)/Patent Under Reexamination** PETERSEN ET AL.
	Examiner WILLIE BERRY JR	**Art Unit** 3652

CPC

Symbol			Type	Version
B65D	88	/ 54	F	2013-01-01
B60P	1	/ 00	A	2013-01-01
A01C	15	/ 003	I	2013-01-01
A01C	15	/ 006	I	2013-01-01
B60P	1	/ 36	I	2013-01-01
B65G	65	/ 32	I	2013-01-01
B65G	65	/ 40	I	2013-01-01
B65G	65	/ 42	I	2013-01-01
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CPC Combination Sets

Symbol	Type	Set	Ranking	Version
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/WILLIE BERRY JR/ Examiner.Art Unit 3652 (Assistant Examiner)	6/26/17 (Date)	**Total Claims Allowed:** 21
/SAUL RODRIGUEZ/ Supervisory Patent Examiner.Art Unit 3652 (Primary Examiner)	06/26/2017 (Date)	O.G. Print Claim(s) 39 / O.G. Print Figure 1

U.S. Patent and Trademark Office

Part of Paper No. 20170626

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14606794	PETERSEN ET AL.
	Examiner	Art Unit
	WILLIE BERRY JR	3652

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
414	528	B 6 3 F 1/00 (2006.01)	

CROSS REFERENCE(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

/WILLIE BERRY JR/ Examiner.Art Unit 3652	6/26/17	Total Claims Allowed: 21	
(Assistant Examiner)	(Date)		
/SAUL RODRIGUEZ/ Supervisory Patent Examiner.Art Unit 3652	06/26/2017	O.G. Print Claim(s) 39	O.G. Print Figure 1
(Primary Examiner)	(Date)		

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14606794	PETERSEN ET AL.
	Examiner	Art Unit
	WILLIE BERRY JR	3652

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	39		56												
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	42		59												
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/WILLIE BERRY JR/ Examiner.Art Unit 3652	6/26/17	Total Claims Allowed:	
(Assistant Examiner)	(Date)	21	
/SAUL RODRIGUEZ/ Supervisory Patent Examiner.Art Unit 3652	06/26/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	39	1

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14606794	PETERSEN ET AL.
	Examiner	Art Unit
	WILLIE BERRY JR	3652

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14606794	PETERSEN ET AL.
	Examiner	Art Unit
	WILLIE BERRY JR	3652

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14606794	PETERSEN ET AL.
	Examiner	Art Unit
	WILLIE BERRY JR	3652

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14606794	PETERSEN ET AL.
	Examiner	Art Unit
	WILLIE BERRY JR	3652

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14606794	PETERSEN ET AL.
	Examiner	Art Unit
	WILLIE BERRY JR	3652

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
Updated Search in parent applications 13/541,553 & 12/031,867	1/9/17	WB

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14606794	PETERSEN ET AL.
	Examiner	Art Unit
	WILLIE BERRY JR	3652

CPC- SEARCHED		
Symbol	Date	Examiner
B60P1/00, 36, 42	6/26/17	WB

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
414	523	6/26/17	WB
111	11	6/26/17	WB
198	312, 315, 316, 317, 318	6/26/17	WB

SEARCH NOTES		
Search Notes	Date	Examiner
Updated Search in parent applications 13/541,553 & 12/031,867	1/9/17	WB
Updated Search	6/26/17	WB

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
All US Class	All US Subclasses	6/26/17	WB

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	589	(414/523).CCLS.	US-PGPUB; USPAT	OR	OFF	2017/06/26 06:58
L2	156	(111/11).CCLS.	US-PGPUB; USPAT	OR	OFF	2017/06/26 07:02
L3	730	(198/312,315,316,317,318).CCLS.	US-PGPUB; USPAT	OR	OFF	2017/06/26 07:03
L4	1565	B60P1/00.cpc.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2017/06/26 07:07
L5	1272	B60P1/36.cpc.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2017/06/26 07:13
L6	590	B60P1/42.cpc.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2017/06/26 07:17

6/ 26/ 2017 7:58:11 AM
C:\ Users\ wberry\ Documents\ EAST\ Workspaces\ 14606794.wsp

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L7	1	"main hopper" and discharge and arm and conveyor and hopper and elevator and "hydraulic piston" and first and second and third and axis and rotatable and perpendicular	US-PGPUB; USPAT	AND	OFF	2017/06/26 07:35

6/26/2017 7:58:39 AM
C:\Users\wberry\Documents\EAST\Workspaces\14606794.wsp

US009745123B2

(12) **United States Patent**
Petersen et al.

(10) **Patent No.: US 9,745,123 B2**
(45) **Date of Patent: Aug. 29, 2017**

(54) **SEED CARRIER WITH PIVOTING CONVEYOR**

(71) Applicant: **UNVERFERTH MANUFACTURING COMPANY, INC.**, Kalida, OH (US)

(72) Inventors: **Brian James Petersen**, Ottawa, OH (US); **David Richard Smith**, Fort Jennings, OH (US)

(73) Assignee: **UNVERFERTH MANUFACTURING COMPANY, INC.**, Kalida, OH (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 305 days.

(21) Appl. No.: **14/606,794**

(22) Filed: **Jan. 27, 2015**

(65) **Prior Publication Data**

US 2015/0197395 A1 Jul. 16, 2015

Related U.S. Application Data

(63) Continuation of application No. 13/541,553, filed on Jul. 3, 2012, now Pat. No. 8,967,940, which is a (Continued)

(51) **Int. Cl.**
B65F 1/00 (2006.01)
B65D 88/54 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ***B65D 88/54*** (2013.01); ***A01C 15/003*** (2013.01); ***A01C 15/006*** (2013.01); ***B60P 1/36*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC B60P 1/00; B60P 1/36; B60P 1/42
(Continued)

(56) **References Cited**

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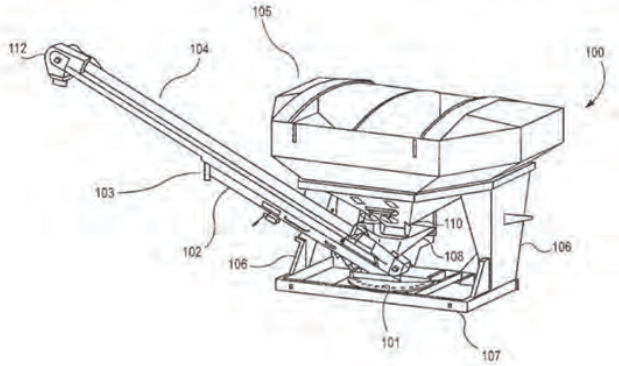
Model 2300 Air System and the Model 4800 Air Drill, both made and sold by Concord, as illustrated in the Concord brochure, 12 pages.
(Continued)

Primary Examiner — Saul Rodriguez
Assistant Examiner — Willie Berry, Jr.
(74) *Attorney, Agent, or Firm* — Rothwell, Figg, Ernst & Manbeck, P.C.

(57) **ABSTRACT**

A seed carrier includes a main hopper coupled with a frame via leg members. The main hopper has a discharge. A base plate is coupled with the frame. A support arm is rotatably coupled with the base plate at a first end. A belt driven conveyor having a conveyor hopper at a first end and a discharge at a second end is rotatably coupled with a second end of the support arm at an approximate center of gravity thereof. A latch mechanism is provided for detachably coupling the first end of the conveyor with the first end of the support arm such that the conveyor hopper is position below the main hopper discharge. When the conveyor is uncoupled from the first end of the support arm, the conveyor can rotate to a loading position wherein the discharge thereof can be positioned over the main hopper.

21 Claims, 11 Drawing Sheets



Related U.S. Application Data

continuation of application No. 12/031,867, filed on Feb. 15, 2008, now Pat. No. 8,221,047.

(60) Provisional application No. 60/901,321, filed on Feb. 15, 2007.

(51) **Int. Cl.**

A01C 15/00	(2006.01)
B60P 1/36	(2006.01)
B65G 65/32	(2006.01)
B65G 65/40	(2006.01)
B65G 65/42	(2006.01)
B60P 1/00	(2006.01)

(52) **U.S. Cl.**

CPC ***B65G 65/32*** (2013.01); ***B65G 65/40*** (2013.01); ***B65G 65/42*** (2013.01); *B60P 1/00* (2013.01)

(58) **Field of Classification Search**

USPC 414/523; 111/11; 198/312, 315, 316, 198/317, 318

See application file for complete search history.

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J&M Manufacturing Company, Inc., J&M Mfg. Co., Inc.'s Amended Initial Invalidity Contentions submitted in *Unverferth Mfg. Co., Inc.* v. *J&M Mfg. Co., Inc.*, Civil Action No. 3:16-cv-02282-JZ (N.D. Ohio), Feb. 7, 2017, 59 pages.

* cited by examiner

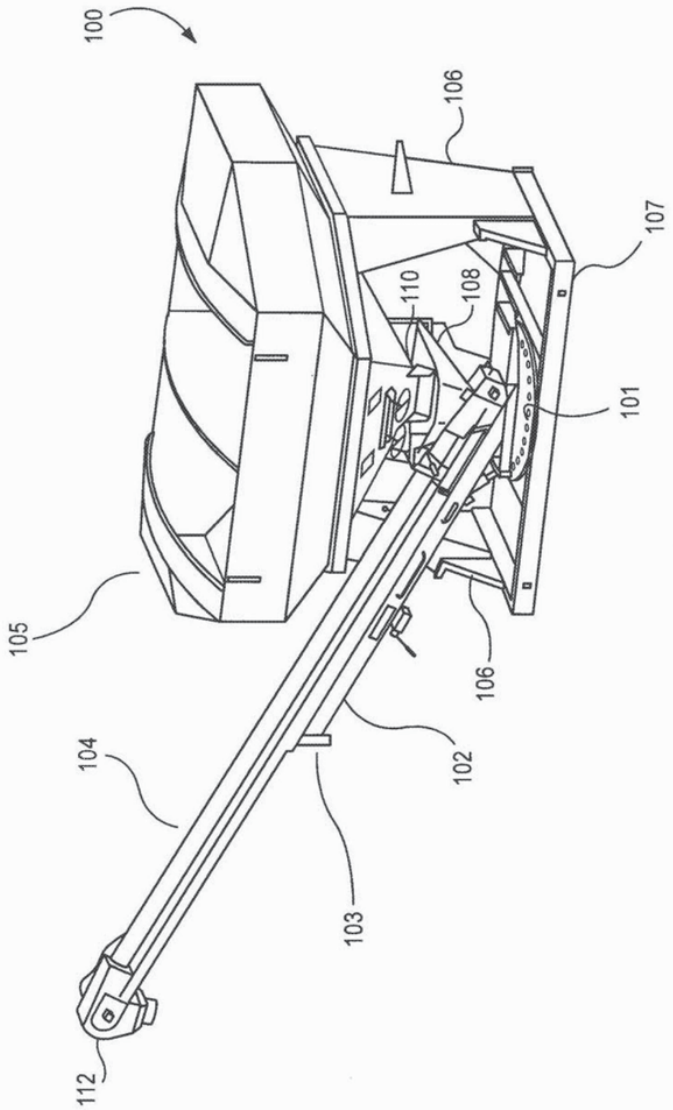


FIG.1

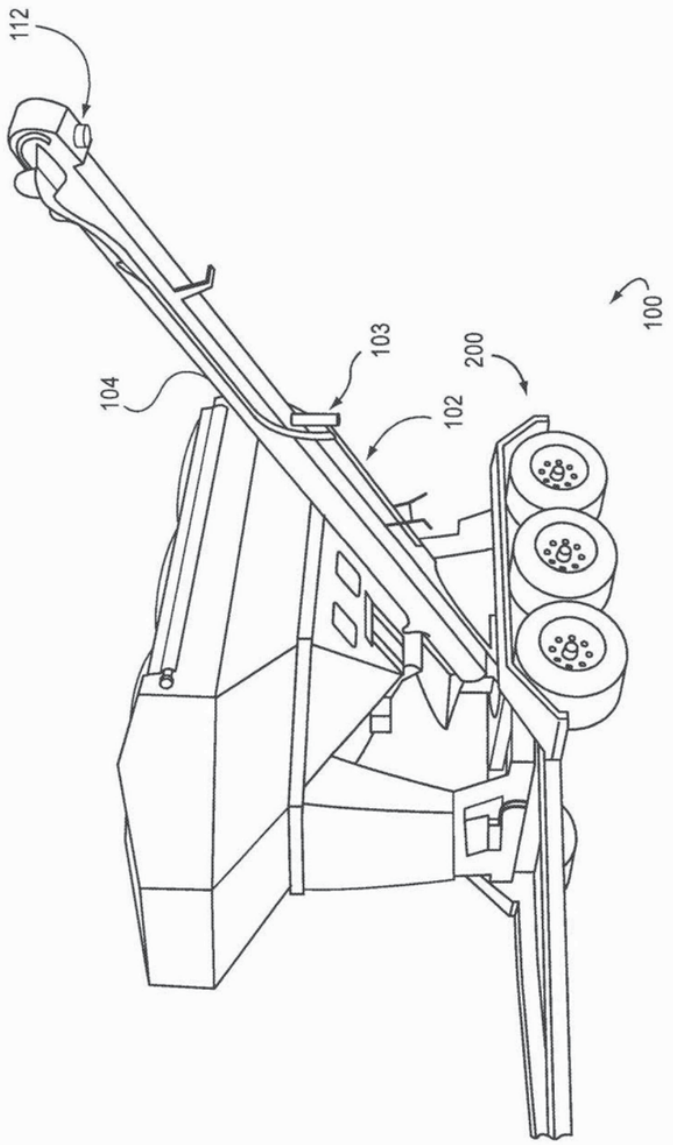


FIG.2

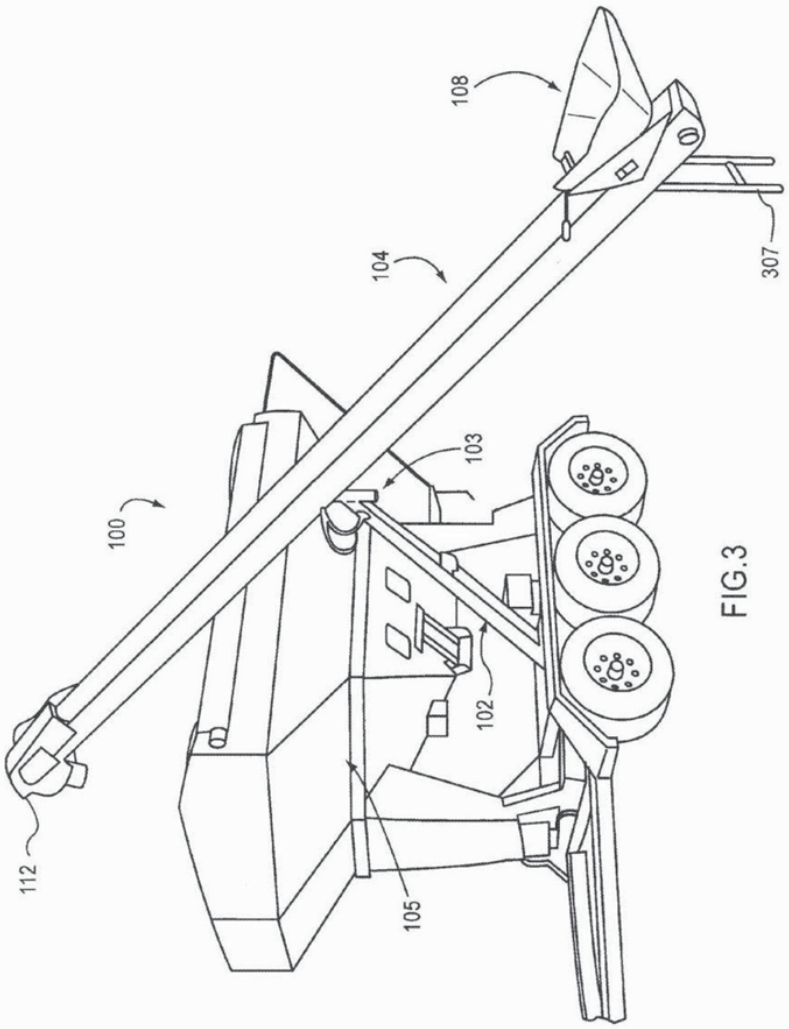


FIG.3

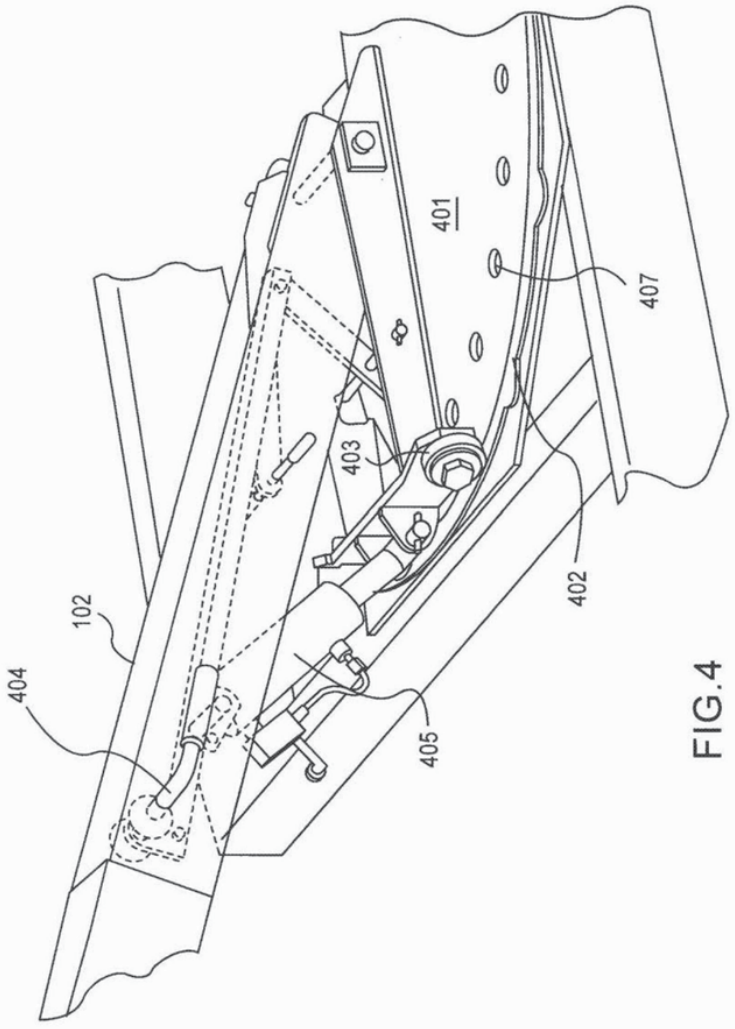


FIG.4

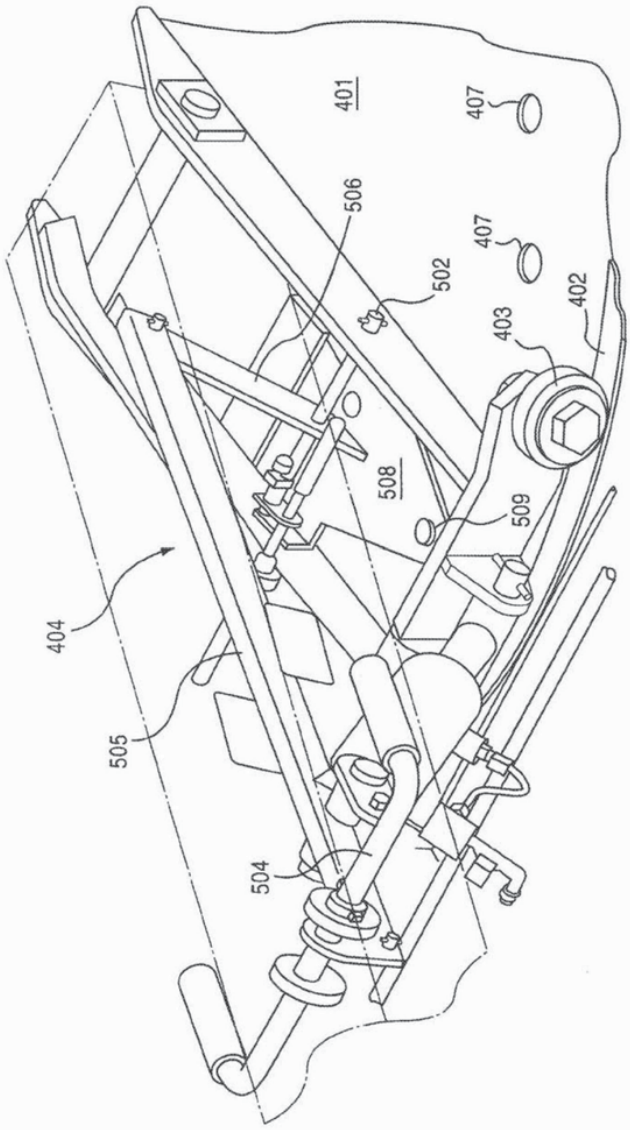


FIG.5

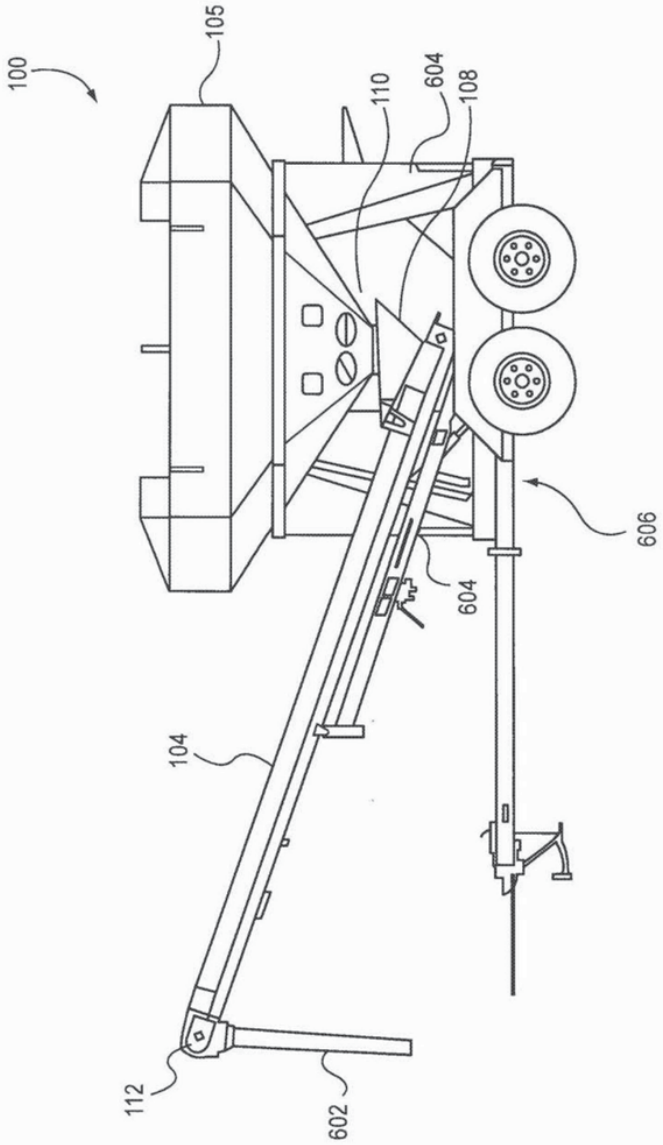


FIG.6

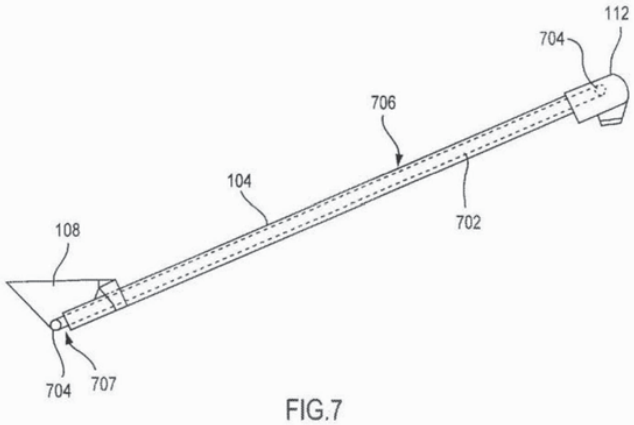


FIG.7

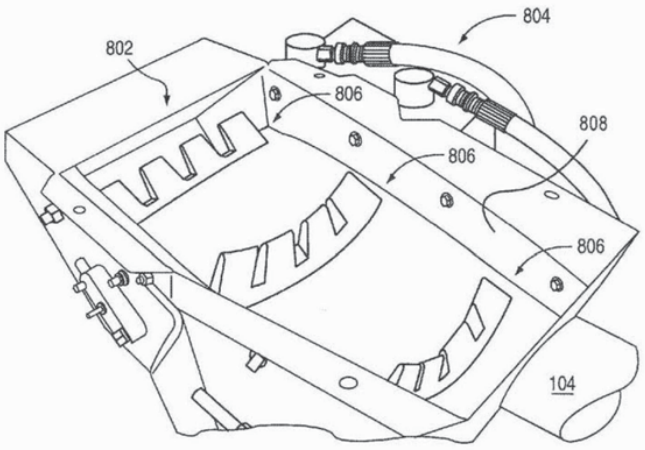


FIG.8

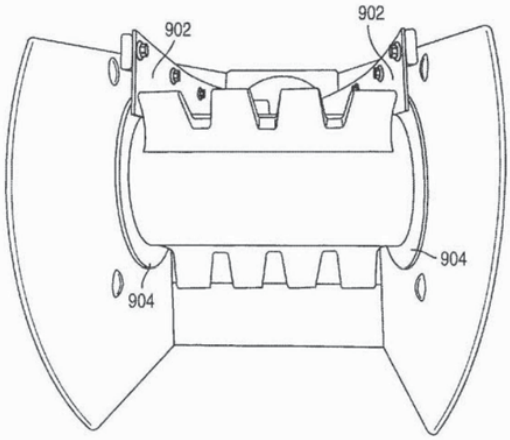


FIG.9

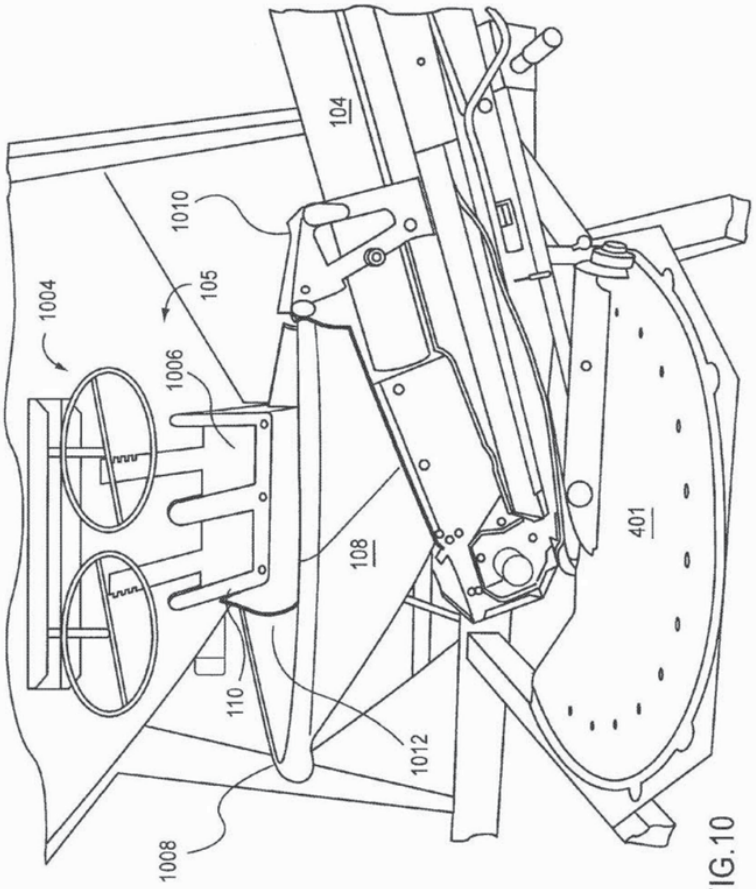


FIG.10

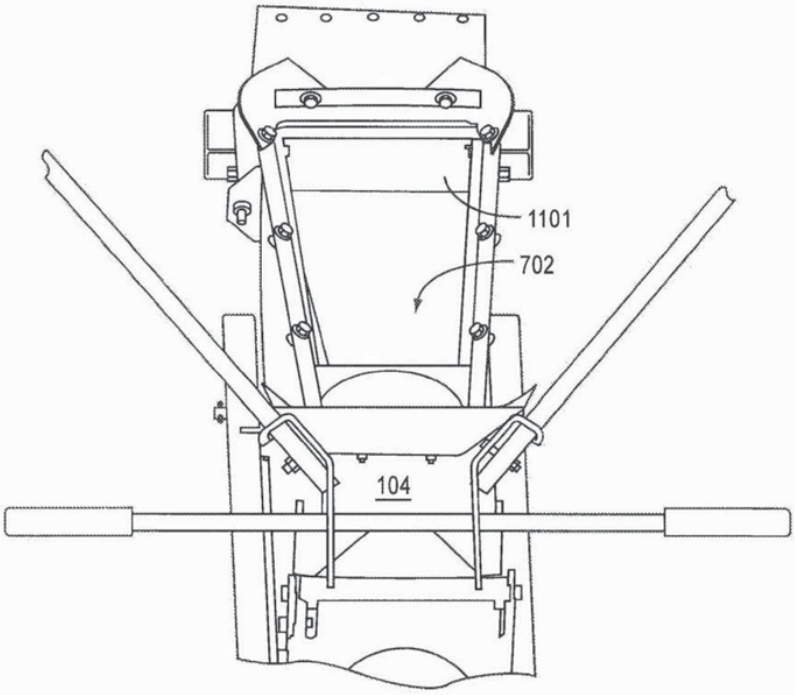


FIG.11

SEED CARRIER WITH PIVOTING CONVEYOR

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application is a Continuation of U.S. application Ser. No. 13/541,553, filed Jul. 3, 2012, which claims priority to U.S. application Ser. No. 12/031,867, filed Feb. 15, 2008, now U.S. Pat. No. 8,221,047, which claims priority to Provisional Patent Application Ser. No. 60/901,321 filed on Feb. 15, 2007, the entire disclosures of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates generally to a conveyor system for a grain or seed carrier. The conveyor system includes a novel pivot system that allows it to either load or unload a container by pivoting it into a loading or unloading position.

Description of the Related Art

Conveyor systems for moving grain, seed, etc. are well known. Auger systems are used to rapidly move grain such as feed or the like, while belt driven conveyors are often used for moving more expensive payload, such as seed.

One belt driven conveyor system includes a generally flat belt constructed from a flexible, sturdy material such as rubber or nylon. The conveyor is housed in a tube with rollers on both ends so that the belt may rotate in order to transmit material from one end to the other. Such conveyors are used for unloading seed carriers or the like. However, current conveyors have several problems.

First, current conveyors have the problem that the material being moved can be damaged by the rollers. Second, current conveyors do not have a full range of motion as implemented in seed carries. Third, current conveyors are only implemented for unloading.

There is a need for new and improved conveyor systems that allow a wagon to be unloaded and loaded using a single mechanism.

SUMMARY OF THE INVENTION

According to an embodiment of the present invention, a seed tender or carrier is provided that includes a main hopper for holding seed and a conveyor for transferring seed to and from the main hopper.

According to an embodiment of the present invention, in an unloading position, one end of the conveyor may be positioned under the discharge of the main hopper and coupled with a pivoting support arm. In the unload position, the conveyor can be used to transfer seed from the main hopper to another location, such as to a planter, seeding unit, or the like. A pivot mechanism allows the conveyor to be rotated from under the box into a loading position in which the conveyor intake can rest on the ground or on a stand while the conveyor discharge is positioned to allow conveyed material to be discharged into the main hopper. In this loading position, the conveyor can be used to fill the main hopper.

According to an embodiment of the present invention, a conveyor hopper is provided on the intake side of the conveyor.

According to an embodiment of the present invention, the pivot mechanism allows the conveyor to swing from side to side to simplify unloading of the main hopper and the filling of planters, etc. The pivot mechanism can include a hydraulic cylinder that adjusts the vertical height of the conveyor discharge relative for different filling applications.

According to an embodiment of the present invention, a pivot single pivot point can be provided at one end of the support arm to allow the conveyor to be rotated between the loading and unloading position. The conveyor may be balanced on the pivot point at a location near or at the center of gravity, thereby permitting the conveyor to be rotated with minimal effort on the part of the operator.

According to an embodiment of the present invention, the conveyor can be rotated through at least 180 degrees about a vertical axis and so that it may be positioned in either a forward or rearward transport position. This feature enables the tender to be pulled by different vehicles such as by a pick-up truck with the conveyor forward or by a grain truck with the conveyor rearward.

Further applications and advantages of various aspects and embodiments of the present invention are discussed below with reference to the drawing figures.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a seed carrier according to an embodiment of the present invention.

FIG. **2** is a view of a seed carrier in an unloading position according to an embodiment of the present invention.

FIG. **3** is a view of a seed carrier in a loading position according to an embodiment of the present invention.

FIG. **4** is a view of a base system for the seed carrier according to an embodiment of the present invention.

FIG. **5** is a view of a lever mechanism for the base system according to an embodiment of the present invention.

FIG. **6** is a view of a seed carrier in a transport position according to an embodiment of the present invention.

FIG. **7** is a view of a belt conveyor for the seed carrier according to an embodiment of the present invention.

FIG. **8** is a view of the discharge end of a conveyor according to an embodiment of the present invention.

FIG. **9** is a forward view of a conveyor belt wrapping around a roller according to an embodiment of the present invention.

FIG. **10** is a view of the conveyor hopper in an unloading position according to an embodiment of the present invention.

FIG. **11** illustrates the receiving end of the conveyor according to one embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

While the present invention may be embodied in many different forms, a number of illustrative embodiments are described herein with the understanding that the present disclosure is to be considered as providing examples of the principles of the invention and such examples are not intended to limit the invention to preferred embodiments described herein and/or illustrated herein.

In embodiments of the present invention, the novel conveyor pivot system can be implemented with seed carrier or seeding machines. The following section describes non-limiting examples of illustrative seeding equipment according to embodiments of the present invention. It should be appreciated that the following examples are provided for illustration and the present invention is not intended to be limited to the embodiments described herein.

FIG. **1** is a diagram depicting a seed carrier having a tube conveyor according to an embodiment of the present invention. The seed carrier **100** includes a main hopper **105** coupled to a frame **107** by legs **106**. A conveyor **104** is supported by a support arm **102** coupled with a pivoting mechanism **101** fixed to the frame **107**. The conveyor **104** is pivotably coupled with the support arm by a coupling **103** at a point that is preferably near or at the center of gravity of the conveyor **104**. The conveyor **104** is also coupled to the support arm **102** by a latch (not shown) at the bottom of the conveyor. The latch allows the conveyor **104** to be uncoupled from the support arm **102** at the bottom so that the conveyor is free to rotate about the coupling **103**. By positioning the coupling **103** at or near the center of gravity of the conveyor **104**, the conveyor **104** balances on the pivoting coupling **103** such that little effort is required to rotate the conveyor **104**.

The conveyor **104** includes a conveyor hopper **108** at its base, which is shown in the unloading position below the gravity discharge **110** of the main hopper **105**. At the other end of the conveyor **104** is the discharge **112**. Seed can be gravity feed from the main hopper **105** into the conveyor hopper **108**, which can then be moved to the discharge **112** of the conveyor **104** by an internal elevator (not shown). In one embodiment, the elevator is a motor-driven belt type elevator coupled onto rollers at both ends of the conveyor.

The seed carrier **100** may be transported by conventional means such as on a trailer. FIG. **2** illustrates the seed carrier **100** on a three axle trailer **200** according to an embodiment of the present invention. As shown, the conveyor **104** is in the unloading position.

FIG. **3** illustrates the seed carrier **100** in the loading position. As shown, the conveyor **104** is uncoupled from the support arm **102** at its base and rotated 180 degrees about pivot coupling **103** so that the conveyor hopper **108** is positioned at a convenient location away from the carrier while the discharge **112** of the conveyor **104** is located over the main hopper **105**. A stand **307** is provided for holding the conveyor hopper **108** in place. The stand **307** may be integrated with the conveyor **104**.

Accordingly, in the loading position, grain, seed or like can be feed into the conveyor hopper **108** to be moved to the discharge **112** for filling the main hopper **105**.

FIG. **4** is a view of the pivoting base of the support arm **102**. As shown, the support arm **102** can be pivotably coupled to a base **401** at a center point so that the support arm **102** is rotatable about a vertical axis. Wheels **403** provide support and can run along a track **402** to facilitate the support arm's **102** motion about the perimeter of the base **401**. The support arm **102** can be locked into a selected position of the base **401** by engaging a pin (not shown) with one of a plurality of the holes **407** distributed around the base **401**. The pin is disengaged with a hole by actuating a lever mechanism **404**, which lifts the pin out of a hole. The lever mechanism **404** may be spring actuated to bias the pin toward the holes, so that simply releasing the lever will allow the pin to engage with one of the holes **407**. Also shown, a hydraulic piston **405** is coupled with the support arm **102** for adjusting the height of the support arm **102**.

FIG. **5** is an alternative view of the support arm base. As shown, lever mechanism **404** includes a handle **504** coupled with a cross-bars **505** and **506**. Cross-bar **506** is coupled to cross-bar **505** on one end and to a plate **508** having a pin **509** on the other end, and with a pivoting coupling **502** at a point near the plate. Rotating the handle **504** applies a downward force to crossbar **506** causing it to rotate about the coupling **502** to raise the plate **508** to disengage the pin **509**. While disengaged, the base **401** is free to rotate about its vertical axis. Springs may be provided for biasing the pin **509** toward the holes **407** for engaging therewith, or the pin **509** can be engaged by gravity.

FIG. **6** is a side view of a seed carrier **100** according to an embodiment of the present invention. As shown in FIG. **6**, the conveyor **104** includes an elongated discharge spout **602** and is positioned in a transport position. Support members **604** may be mounted on or integral with the legs **106** for holding the conveyor **104** in a forward transport position as shown, or a rearward transport position. As shown, the carrier **100** is fixed to a dual axle trailer **606**.

FIG. **7** illustrates a basic belt driven conveyor according to an embodiment of the present invention. The conveyor **104** comprises a belt **702** that winds about a pair of rollers **704**. The rollers are positioned outside a tube section **706**, a first roller being positioned in the discharge **112** and a second roller being positioned below the conveyor hopper **108**. A motor (not shown) or other means for turning the rollers may be provided at either end of the conveyor. A void **707** exists below the rollers **704** to allow the belt **702** to travel on its return path.

FIG. **8** is a view of a conveyor belt according to an embodiment of the present invention. The discharge end of a conveyor is shown where a conveyor belt wraps around a motor driven roller **802**. The motor may be a hydraulic motor and therefore, hydraulic hoses **804** provide hydraulic fluid flow to and from the motor. Teeth **806** are provided to push grain or seed up the conveyor. As shown, the conveyor belt is cupped in the tube section but flattens out as it reaches the roller **802**. Channeling members (seals) **808** are provided on each side of the belt to form a seal and prevent grain or seed from falling off the edges of the belt as the belt begins to conform to the tubular portion of the conveyor **104**.

FIG. **9** is a front view of the belt as it travels over the roller **802**. Channeling members (seals) **902** are provided on each side of the belt to form a seal and prevent grain or seed from falling off the edges of the belt as the belt flattens at the roller. As shown, the channeling members **902** are fixed to the conveyor discharge **112** with bolts, but can be fixed by other means or can be integral with the discharge.

Discs **904** are provided at the rollers at the edge of the belt to provide additional channeling/sealing means. The discs **904** are preferably integral with the rollers or coupled therewith so that they may rotate.

FIG. **10** is a side view of the hopper end of the conveyor **104**. As shown, conveyor hopper **108** sits above in ingress to the conveyor **104**. When coupled to the support arm **102**, as shown, the conveyor hopper **108** is positioned below a discharge of the main hopper **106**. The discharge **110** may be opened by conventional means. As showed, a wheel handle mechanism **1004** is provided for opening the discharge doors **1006**.

The conveyor hopper **108** is preferably manufactured from light weight materials such as plastic, canvas, rubber or vinyl. As shown, the hopper **108** may include a mechanism for opening and closing the hopper. In this embodiment, flexible coupling or hinge is provided at one end **1008** of the hopper **108** and a mechanism **1010** is provided at the end of the hopper **108** and is coupled with the conveyor **104**, such that the hopper **108** may be made to have an appropriate fit with the discharge **110** of the main hopper **105**. A flap **1012** can be provided at the bottom of the discharge **110**.

FIG. **11** is a schematic view of the hopper end of the conveyor. As is shown, a brush seal **1101** can be located across the belt **702**. The brush seal **1101** retains the conveyed material within the hopper and does not allow the material

to enter the void **707** (shown in FIG. **7**) under the roller. Such an arrangement is desirable because it prevents the conveyed material from being subjected to mechanical agitation, which would result in damage to the conveyed material. The brush seal **1101** allows the conveyor teeth **806** to pass, but not the conveyed material.

One will understand that hydraulic power can be provided by a towing vehicle, such as a tractor or the like or alternatively, hydraulic power can be provided on the tender and driving electrically from the towing vehicle, such as a truck.

Thus, a number of preferred embodiments have been fully described above with reference to the drawing figures. Although the invention has been described based upon these preferred embodiments, it would be apparent to those of skill in the art that certain modifications, variations, and alternative constructions could be made to the described embodiments within the spirit and scope of the invention.

We claim:

1. A seed or grain tender comprising:

a main hopper having a main hopper discharge;

a support arm having first and second ends;

said first end of said support arm being located below said main hopper and being rotatable about a first axis of rotation, and said first end of said support arm being rotatable about a second axis of rotation that is perpendicular to said first axis of rotation;

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge;

said second end of said support arm being coupled with said conveyor between said first and second ends of said conveyor, said conveyor being rotatable about a third axis of rotation at said second end of said support arm that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said third of axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper, and

a hydraulic piston extending at an acute angle relative to a horizontal plane to connect with a portion of said support arm spaced from said second axis of rotation.

2. The seed or grain tender of claim **1**, wherein said first axis of rotation extends through said main hopper discharge.

3. The seed or grain tender of claim **1**, wherein said second axis of rotation extends through said first end of said support arm.

4. The seed or grain tender of claim **1**, wherein said third axis of rotation extends through said conveyor.

5. The seed or grain tender of claim **1**, wherein said third axis of rotation extends through said second end of said support arm.

6. The seed or grain tender of claim **1**, wherein said third axis of rotation extends through said conveyor and said second end of said support arm.

7. The seed or grain tender of claim **1**, wherein said third axis of rotation is oriented at an angle having a vertical component.

8. The seed or grain tender of claim **1**, wherein said second end of said support arm is coupled with said conveyor at or near said approximate center of gravity of said conveyor.

9. The seed or grain tender of claim **1**, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.

10. A seed or grain tender comprising:

a main hopper having an upper portion with a main hopper intake opening and a lower portion with a main hopper discharge;

a support arm having a first end proximate said lower portion of said main hopper and a second end;

wherein said support arm is pivotable about a first axis of rotation proximate said first end of said support arm to cause said support arm to be movable between an operating position wherein said support arm extends outwardly relative to said main hopper and a storage position wherein said support arm is folded inwardly towards said main hopper in relation to said operating position, said support arm further being pivotable about a second axis of rotation proximate said first end of said support arm to cause an elevation of said second end of said support arm to be adjustable;

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge; and

said second end of said support arm being coupled with said conveyor between said first and second conveyor ends, said conveyor being rotatable about a third axis of rotation proximate said second end of said support arm that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said third of axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said intake opening of said main hopper to dispense agricultural product into said main hopper.

11. The seed or grain tender of claim **10**, wherein said first axis of rotation extends through said main hopper discharge.

12. The seed or grain tender of claim **10**, wherein said second axis of rotation extends through said first end of said support arm.

13. The seed or grain tender of claim **10**, wherein said third axis of rotation extends through said conveyor.

14. The seed or grain tender of claim **10**, wherein said third axis of rotation extends through said second end of said support arm.

15. The seed or grain tender of claim **10**, wherein said third axis of rotation extends through said conveyor and said second end of said support arm.

16. The seed or grain tender of claim **10**, wherein said third axis of rotation is oriented at an angle having a vertical component.

17. The seed or grain tender of claim **16**, wherein said first axis of rotation is vertical.

18. The seed or grain tender of claim **17**, wherein said second axis of rotation is horizontal.

19. The seed or grain tender of claim 10, wherein said second end of said support arm is coupled with said conveyor at an approximate center of gravity of said conveyor.

20. The seed or grain tender of claim 10, further comprising a hydraulic piston extending at an acute angle relative to a horizontal plane to connect with a portion of said support arm spaced from said second axis of rotation.

21. The seed or grain tender of claim 10, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.

* * * * *

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APPLICANTS
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INVENTORS
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**** CONTINUING DATA ************************
This application is a CON of 13/541,553 07/03/2012 PAT 8967940
which is a CON of 12/031,867 02/15/2008 PAT 8221047
which claims benefit of 60/901,321 02/15/2007

**** FOREIGN APPLICATIONS ************************

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Foreign Priority claimed	☐ Yes ☑ No	☐ Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
35 USC 119(a-d) conditions met	☐ Yes ☑ No					
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TITLE
SEED CARRIER WITH PIVOTING CONVEYOR

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First Named Inventor/Applicant Name:	Brian James PETERSEN
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1	Application Data Sheet	1994-363US2-ADS.pdf	1101826	no	7
Warnings:					
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2	Drawings-only black and white line drawings	1994-363US2-Drawings.pdf	683860	no	11
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3		1994-363US2-Spec.pdf	1495811	yes	16

	Multipart Description/PDF files in .zip description		
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	Claims	10	15
	Abstract	16	16

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National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
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PTO/AIA/14 (12-13)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1994-363US2
	Application Number	
Title of Invention	SEED CARRIER WITH PIVOTING CONVEYOR	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
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Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

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Inventor 2 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	David	Richard	SMITH	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

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Address 2			
City	Fort Jennings	State/Province	OH
Postal Code	45844	Country	US

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1994-363US2
	Application Number	
Title of Invention	SEED CARRIER WITH PIVOTING CONVEYOR	

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Application Information:

Title of the Invention	SEED CARRIER WITH PIVOTING CONVEYOR		
Attorney Docket Number	1994-363US2	**Small Entity Status Claimed** ☐	
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	11	**Suggested Figure for Publication (if any)**	

Filing By Reference :

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For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

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☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1994-363US2
	Application Number	
Title of Invention	SEED CARRIER WITH PIVOTING CONVEYOR	

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When referring to the current application, please leave the application number blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	13541553	2012-07-03

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13541553	Continuation of	12031867	2008-02-15	8221047	2012-07-17

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
12031867	Claims benefit of provisional	60901321	2007-02-15

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Application Number	Country[1]	Filing Date (YYYY-MM-DD)	Access Code[1] (if applicable)

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1994-363US2
	Application Number	
Title of Invention	SEED CARRIER WITH PIVOTING CONVEYOR	

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

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Applicant Information:

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1994-363US2
	Application Number	
Title of Invention	SEED CARRIER WITH PIVOTING CONVEYOR	

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

(●) Assignee ( ) Legal Representative under 35 U.S.C. 117 ( ) Joint Inventor

( ) Person to whom the inventor is obligated to assign. ( ) Person who shows sufficient proprietary interest

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

Organization Name	UNVERFERTH MANUFACTURING COMPANY, INC.		
Mailing Address Information For Applicant:			
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Address 2			
City	Kalida	**State/Province**	OH
Country	US	Postal Code	45853
Phone Number		Fax Number	
Email Address			

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1994-363US2
	Application Number	
Title of Invention	SEED CARRIER WITH PIVOTING CONVEYOR	

Organization Name	UNVERFERTH MANUFACTURING COMPANY, INC.

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	601 South Broad Street		
Address 2			
City	Kalida	**State/Province**	OH
Country i	US	Postal Code	45853
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Signature				Date (YYYY-MM-DD)	2015-01-27
First Name	Jason M.	Last Name	Shapiro	Registration Number	35354

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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Brian James Petersen et al.
1994-363US2

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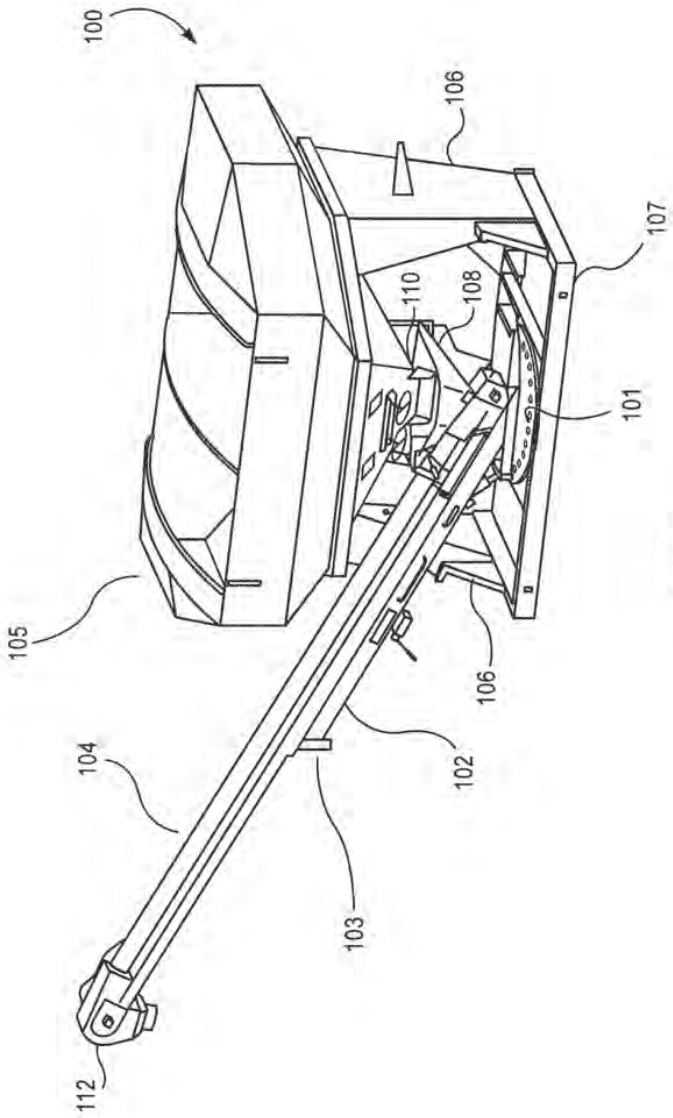


FIG.1

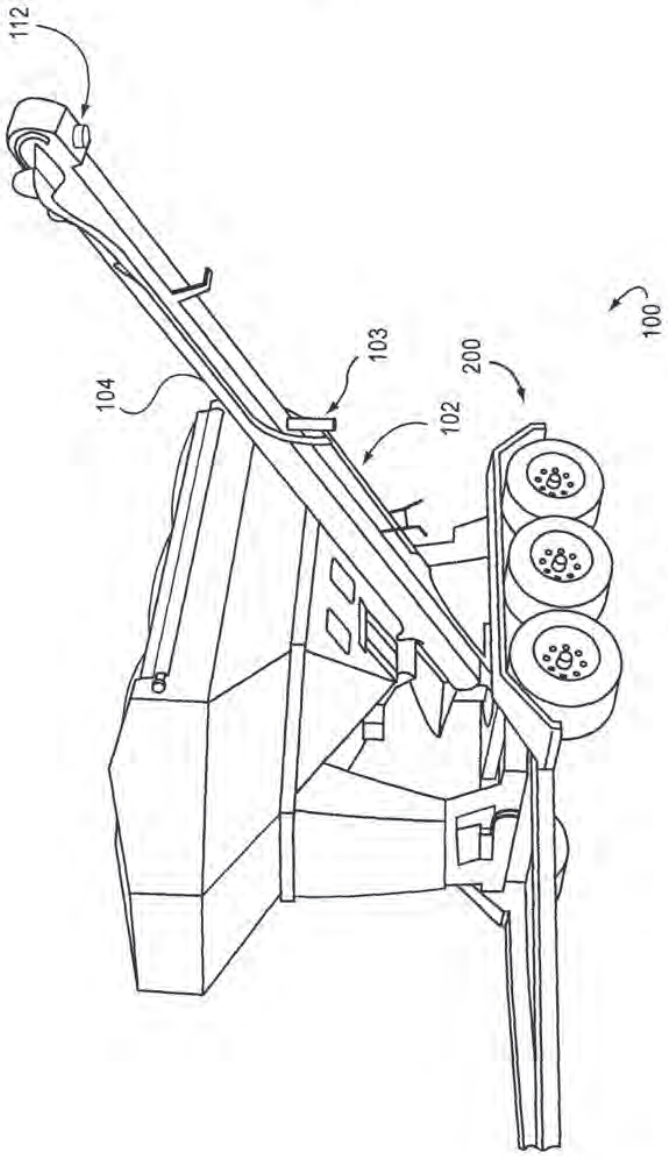


FIG.2

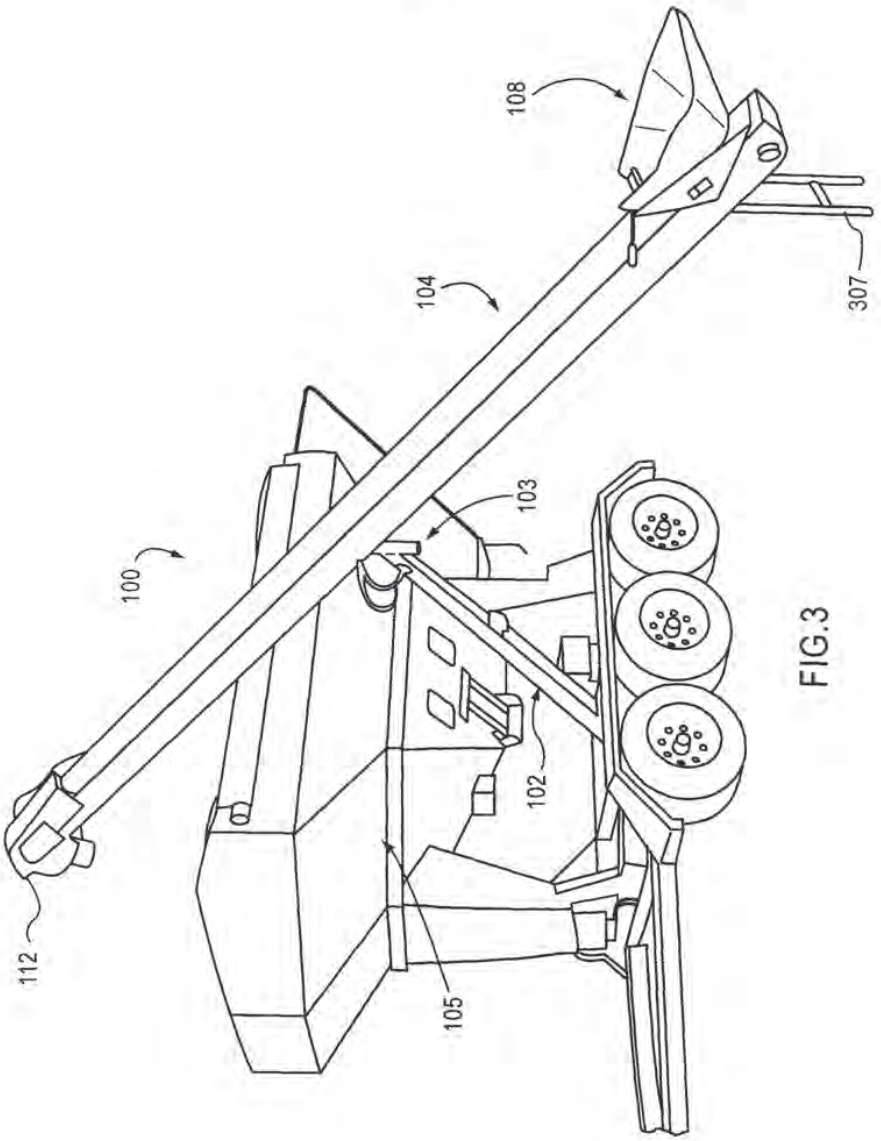


FIG.3

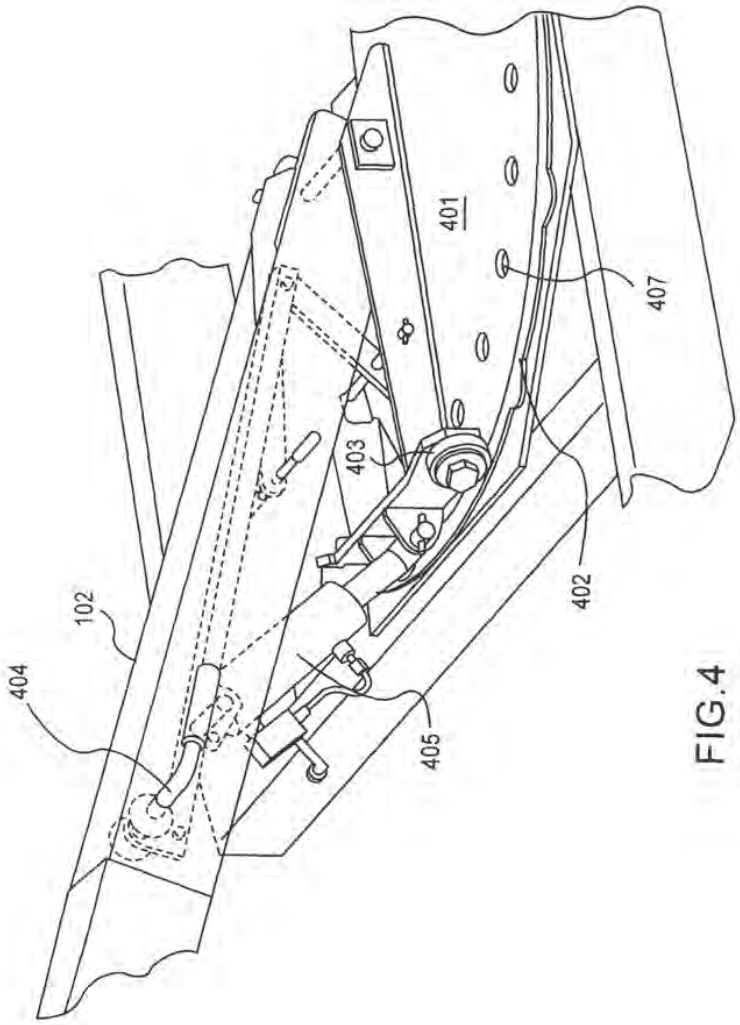


FIG.4

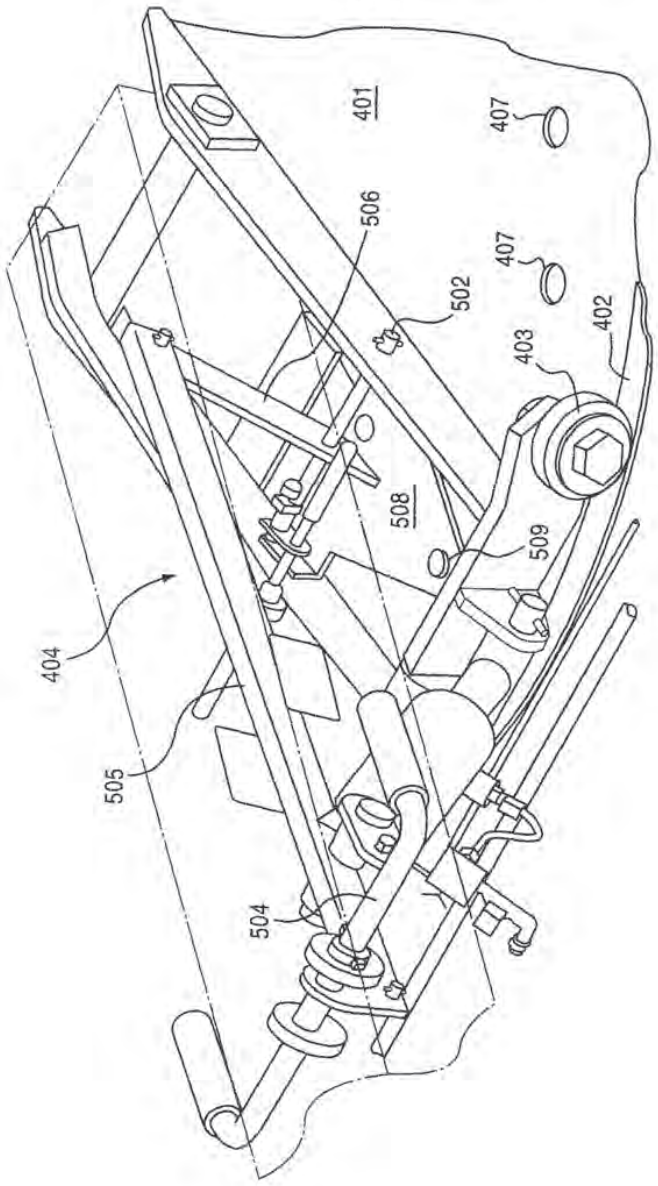


FIG.5

6/11

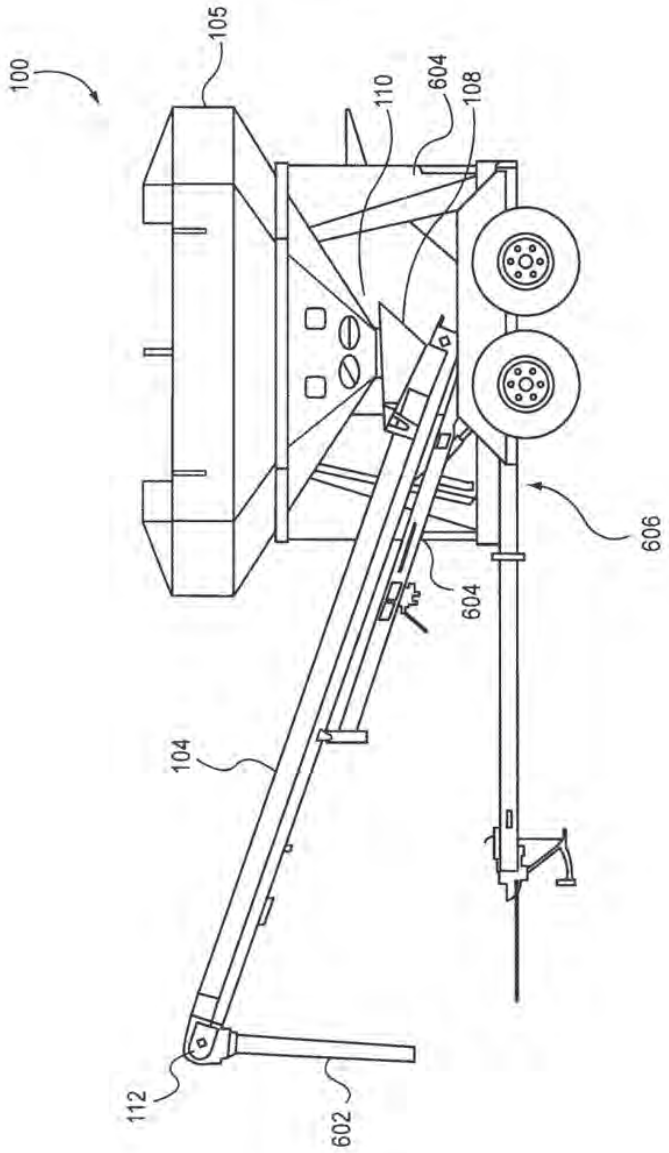


FIG.6

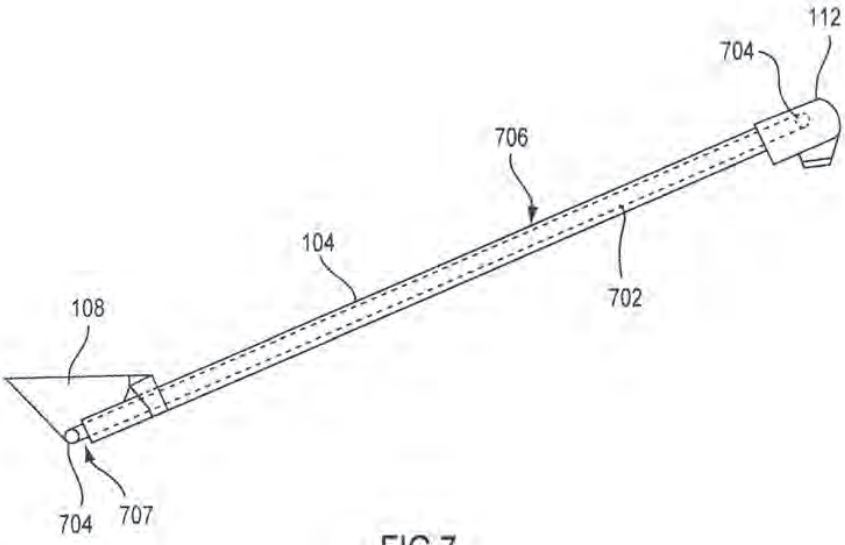


FIG.7

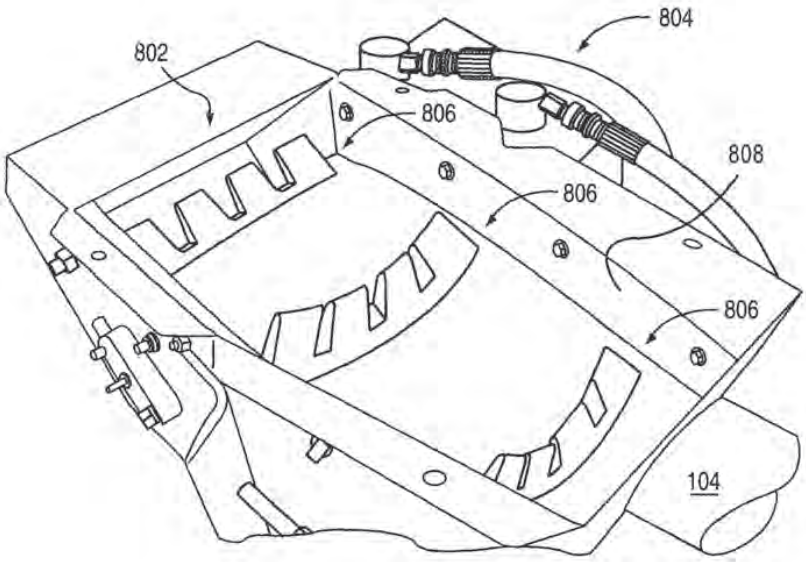


FIG.8

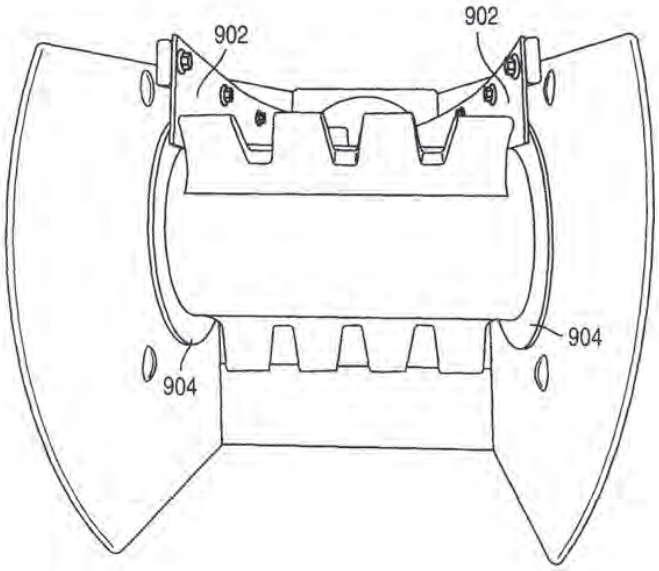


FIG.9

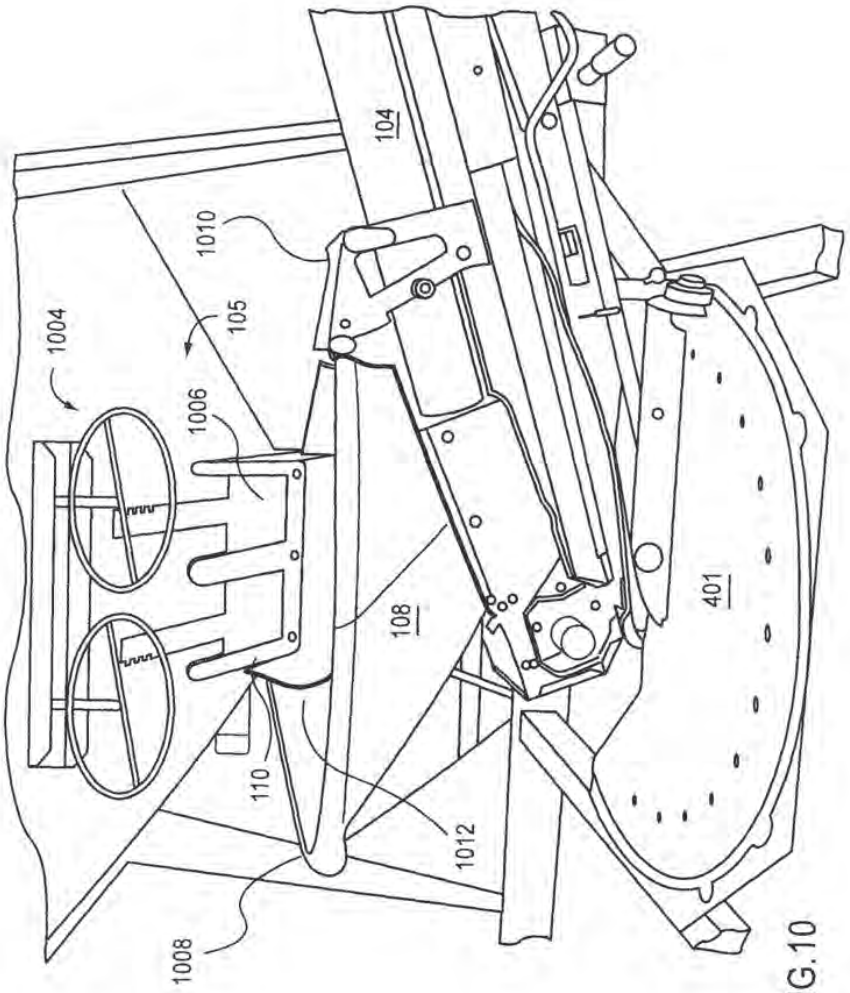


FIG.10

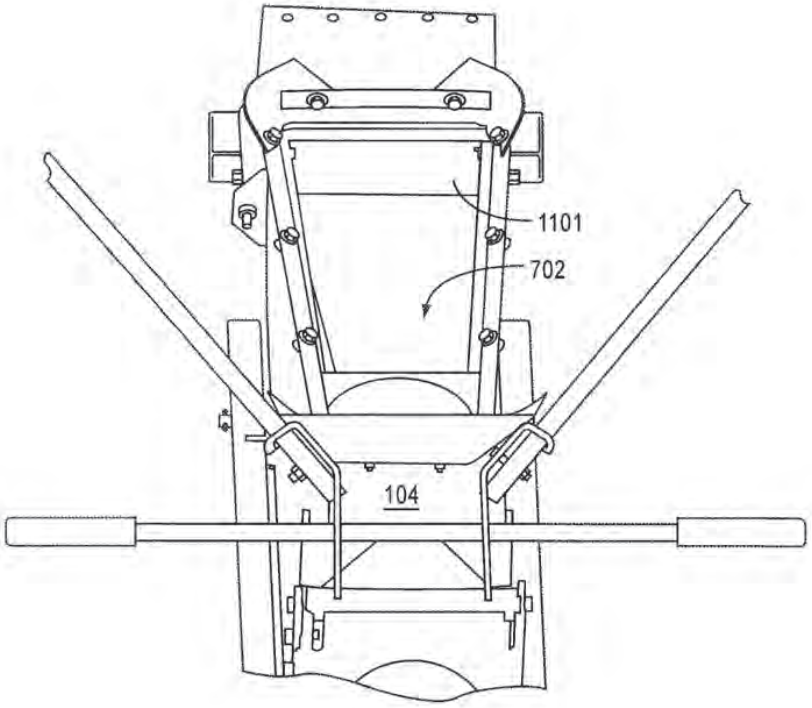


FIG.11

TITLE OF THE INVENTION

SEED CARRIER WITH PIVOTING CONVEYOR

BACKGROUND OF THE INVENTION

Cross-Reference to Related Applications

[0001] The present application is a Continuation of U.S. application Serial No. 13/541,553, filed July 3, 2012, which claims priority to U.S. application Serial No. 12/031,867, filed February 15, 2008, now Patent No. 8,221,047, which claims priority to Provisional Patent Application Serial. No. 60/901,321 filed on Feb. 15, 2007, the entire disclosures of which are incorporated herein by reference.

Field of the Invention

[0002] The present invention relates generally to a conveyor system for a grain or seed carrier. The conveyor system includes a novel pivot system that allows it to either load or unload a container by pivoting it into a loading or unloading position.

Description of the Related Art

[0003] Conveyor systems for moving grain, seed, etc. are well known. Auger systems are used to rapidly move grain such as feed or the like, while belt driven conveyors are often used for moving more expensive payload, such as seed.

[0004] One belt driven conveyor system includes a generally flat belt constructed from a flexible, sturdy material such as rubber or nylon. The conveyor is housed in a tube with rollers on both ends so that the belt may rotate in order to transmit material from one end to the other. Such conveyors are used for unloading seed carriers or the like. However, current conveyors have several problems.

[0005] First, current conveyors have the problem that the material being moved can be damaged by the rollers. Second, current conveyors do not have a full range of motion as implemented in seed carries. Third, current conveyors are only implemented for unloading.

[0006] There is a need for new and improved conveyor systems that allow a wagon to be unloaded and loaded using a single mechanism.

SUMMARY OF THE INVENTION

[0007] According to an embodiment of the present invention, a seed tender or carrier is provided that includes a main hopper for holding seed and a conveyor for transferring seed to and from the main hopper.

[0008] According to an embodiment of the present invention, in an unloading position, one end of the conveyor may be positioned under the discharge of the main hopper and coupled with a pivoting support arm. In the unload position, the conveyor can be used to transfer seed from the main hopper to another location, such as to a planter, seeding unit, or the like. A pivot mechanism allows the conveyor to be rotated from under the box into a loading position in which the conveyor intake can rest on the ground or on a stand while the conveyor discharge is positioned to allow conveyed material to be discharged into the main hopper. In this loading position, the conveyor can be used to fill the main hopper.

[0009] According to an embodiment of the present invention, a conveyor hopper is provided on the intake side of the conveyor.

[0010] According to an embodiment of the present invention, the pivot

mechanism allows the conveyor to swing from side to side to simplify unloading of the main hopper and the filling of planters, etc. The pivot mechanism can include a hydraulic cylinder that adjusts the vertical height of the conveyor discharge relative for different filling applications.

[0011] According to an embodiment of the present invention, a pivot single pivot point can be provided at one end of the support arm to allow the conveyor to be rotated between the loading and unloading position. The conveyor may be balanced on the pivot point at a location near or at the center of gravity, thereby permitting the conveyor to be rotated with minimal effort on the part of the operator.

[0012] According to an embodiment of the present invention, the conveyor can be rotated through at least 180 degrees about a vertical axis and so that it may be positioned in either a forward or rearward transport position. This feature enables the tender to be pulled by different vehicles such as by a pick-up truck with the conveyor forward or by a grain truck with the conveyor rearward.

[0013] Further applications and advantages of various aspects and embodiments of the present invention are discussed below with reference to the drawing figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 illustrates a seed carrier according to an embodiment of the present invention.

[0015] FIG. 2 is a view of a seed carrier in an unloading position according to an embodiment of the present invention.

[0016] FIG. 3 is a view of a seed carrier in a loading position according to an embodiment of the present invention.

[0017] Fig. 4 is a view of a base system for the seed carrier according to an embodiment of the present invention.

[0018] Fig. 5 is a view of a lever mechanism for the base system according to an embodiment of the present invention.

[0019] Fig. 6 is a view of a seed carrier in a transport position according to an embodiment of the present invention.

[0020] Fig. 7 is a view of a belt conveyor for the seed carrier according to an embodiment of the present invention.

[0021] Fig. 8 is a view of the discharge end of a conveyor according to an embodiment of the present invention.

[0022] Fig. 9 is a forward view of a conveyor belt wrapping around a roller according to an embodiment of the present invention.

[0023] Fig. 10 is a view of the conveyor hopper in an unloading position according to an embodiment of the present invention.

[0024] Fig. 11 illustrates the receiving end of the conveyor according to one embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0025] While the present invention may be embodied in many different forms, a number of illustrative embodiments are described herein with the understanding that the present disclosure is to be considered as providing examples of the principles of the invention and such examples are not intended to limit the invention to preferred embodiments described herein and/or illustrated herein.

[0026] In embodiments of the present invention, the novel conveyor pivot system

can be implemented with seed carrier or seeding machines. The following section describes non-limiting examples of illustrative seeding equipment according to embodiments of the present invention. It should be appreciated that the following examples are provided for illustration and the present invention is not intended to be limited to the embodiments described herein.

[0027] FIG. 1 is a diagram depicting a seed carrier having a tube conveyor according to an embodiment of the present invention. The seed carrier 100 includes a main hopper 105 coupled to a frame 107 by legs 106. A conveyor 104 is supported by a support arm 102 coupled with a pivoting mechanism 101 fixed to the frame 107. The conveyor 104 is pivotably coupled with the support arm by a coupling 103 at a point that is preferably near or at the center of gravity of the conveyor 104. The conveyor 104 is also coupled to the support arm 102 by a latch (not shown) at the bottom of the conveyor. The latch allows the conveyor 104 to be uncoupled from the support arm 102 at the bottom so that the conveyor is free to rotate about the coupling 103. By positioning the coupling 103 at or near the center of gravity of the conveyor 104, the conveyor 104 balances on the pivoting coupling 103 such that little effort is required to rotate the conveyor 104.

[0028] The conveyor 104 includes a conveyor hopper 108 at its base, which is shown in the unloading position below the gravity discharge 110 of the main hopper 105. At the other end of the conveyor 104 is the discharge 112. Seed can be gravity feed from the main hopper 105 into the conveyor hopper 108, which can then be moved to the discharge 112 of the conveyor 104 by an internal elevator (not shown). In one embodiment, the elevator is a motor-driven belt type elevator coupled onto rollers at

both ends of the conveyor.

[0029] The seed carrier 100 may be transported by conventional means such as on a trailer. Fig. 2 illustrates the seed carrier 100 on a three axle trailer 200 according to an embodiment of the present invention. As shown, the conveyor 104 is in the unloading position.

[0030] Fig. 3 illustrates the seed carrier 100 in the loading position. As shown, the conveyor 104 is uncoupled from the support arm 102 at its base and rotated 180 degrees about pivot coupling 103 so that the conveyor hopper 108 is positioned at a convenient location away from the carrier while the discharge 112 of the conveyor 104 is located over the main hopper 105. A stand 307 is provided for holding the conveyor hopper 108 in place. The stand 307 may be integrated with the conveyor 104.

[0031] Accordingly, in the loading position, grain, seed or like can be feed into the conveyor hopper 108 to be moved to the discharge 112 for filling the main hopper 105.

[0032] Fig. 4 is a view of the pivoting base of the support arm 102. As shown, the support arm 102 can be pivotably coupled to a base 401 at a center point so that the support arm 102 is rotatable about a vertical axis. Wheels 403 provide support and can run along a track 402 to facilitate the support arm's 102 motion about the perimeter of the base 401. The support arm 102 can be locked into a selected position of the base 401 by engaging a pin (not shown) with one of a plurality of the holes 407 distributed around the base 401. The pin is disengaged with a hole by actuating a lever mechanism 404, which lifts the pin out of a hole. The lever mechanism 404 may be spring actuated to bias the pin toward the holes, so that simply releasing the lever will allow the pin to engage with one of the holes 407. Also shown, a hydraulic piston 405 is coupled with

the support arm 102 for adjusting the height of the support arm 102.

[0033] Fig. 5 is an alternative view of the support arm base. As shown, lever mechanism 404 includes a handle 504 coupled with a cross-bars 505 and 506. Cross-bar 506 is coupled to cross-bar 505 on one end and to a plate 508 having a pin 509 on the other end, and with a pivoting coupling 502 at a point near the plate. Rotating the handle 504 applies a downward force to crossbar 506 causing it to rotate about the coupling 502 to raise the plate 508 to disengage the pin 509. While disengaged, the base 401 is free to rotate about its vertical axis. Springs may be provided for biasing the pin 509 toward the holes 407 for engaging therewith, or the pin 509 can be engaged by gravity.

[0034] Fig. 6 is a side view of a seed carrier 100 according to an embodiment of the present invention. As shown in FIG. 6, the conveyor 104 includes an elongated discharge spout 602 and is positioned in a transport position. Support members 604 may be mounted on or integral with the legs 106 for holding the conveyor 104 in a forward transport position as shown, or a rearward transport position. As shown, the carrier 100 is fixed to a dual axle trailer 606.

[0035] Fig. 7 illustrates a basic belt driven conveyor according to an embodiment of the present invention. The conveyor 104 comprises a belt 702 that winds about a pair of rollers 704. The rollers are positioned outside a tube section 706, a first roller being positioned in the discharge 112 and a second roller being positioned below the conveyor hopper 108. A motor (not shown) or other means for turning the rollers may be provided at either end of the conveyor. A void 707 exists below the rollers 704 to allow the belt 702 to travel on its return path.

[0036] Fig. 8 is a view of a conveyor belt according to an embodiment of the present invention. The discharge end of a conveyor is shown where a conveyor belt wraps around a motor driven roller 802. The motor may be a hydraulic motor and therefore, hydraulic hoses 804 provide hydraulic fluid flow to and from the motor. Teeth 806 are provided to push grain or seed up the conveyor. As shown, the conveyor belt is cupped in the tube section but flattens out as it reaches the roller 802. Channeling members (seals) 808 are provided on each side of the belt to form a seal and prevent grain or seed from falling off the edges of the belt as the belt begins to conform to the tubular portion of the conveyor 104.

[0037] Fig. 9 is a front view of the belt as it travels over the roller 802. Channeling members (seals) 902 are provided on each side of the belt to form a seal and prevent grain or seed from falling off the edges of the belt as the belt flattens at the roller. As shown, the channeling members 902 are fixed to the conveyor discharge 112 with bolts, but can be fixed by other means or can be integral with the discharge.

[0038] Discs 904 are provided at the rollers at the edge of the belt to provide additional channeling/sealing means. The discs 904 are preferably integral with the rollers or coupled therewith so that they may rotate.

[0039] FIG. 10 is a side view of the hopper end of the conveyor 104. As shown, conveyor hopper 108 sits above in ingress to the conveyor 104. When coupled to the support arm 102, as shown, the conveyor hopper 108 is positioned below a discharge of the main hopper 106. The discharge 110 may be opened by conventional means. As showed, a wheel handle mechanism 1004 is provided for opening the discharge doors 1006.

[0040] The conveyor hopper 108 is preferably manufactured from light weight materials such as plastic, canvas, rubber or vinyl. As shown, the hopper 108 may include a mechanism for opening and closing the hopper. In this embodiment, flexible coupling or hinge is provided at one end 1008 of the hopper 108 and a mechanism 1010 is provided at the end of the hopper 108 and is coupled with the conveyor 104, such that the hopper 108 may be made to have an appropriate fit with the discharge 110 of the main hopper 105. A flap 1012 can be provided at the bottom of the discharge 110.

[0041] FIG. 11 is a schematic view of the hopper end of the conveyor. As is shown, a brush seal 1101 can be located across the belt 702. The brush seal 1101 retains the conveyed material within the hopper and does not allow the material to enter the void 707 (shown in FIG. 7) under the roller. Such an arrangement is desirable because it prevents the conveyed material from being subjected to mechanical agitation, which would result in damage to the conveyed material. The brush seal 1101 allows the conveyor teeth 806 to pass, but not the conveyed material.

[0042] One will understand that hydraulic power can be provided by a towing vehicle, such as a tractor or the like or alternatively, hydraulic power can be provided on the tender and driving electrically from the towing vehicle, such as a truck.

[0043] Thus, a number of preferred embodiments have been fully described above with reference to the drawing figures. Although the invention has been described based upon these preferred embodiments, it would be apparent to those of skill in the art that certain modifications, variations, and alternative constructions could be made to the described embodiments within the spirit and scope of the invention.

We claim:

1. A seed or grain tender comprising:

a frame;

a main hopper mounted on said frame and having a main hopper discharge;

a base mounted on said frame below said main hopper discharge;

a support arm having first and second ends;

a first coupling connecting said first end of said support arm with said base, said first coupling being rotatable in relation to said base about a first vertical axis of rotation, and said first end of said support arm being rotatable in relation to said first coupling about a first horizontal axis of rotation;

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge; and

a second coupling connecting said second end of said support arm with said conveyor at an approximate center of gravity of said conveyor, said second coupling defining a second vertical axis of rotation that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said second vertical axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper.

2. The seed or grain tender of claim 1, wherein said support arm extends upwardly at an acute angle from said base.

3. The seed or grain tender of claim 2, wherein said conveyor is parallel to said support arm in said unloading position.

4. The seed or grain tender of claim 3, wherein said conveyor is disposed above said support arm in said unloading position.

5. The seed or grain tender of claim 1, wherein said first end of said conveyor is detachably connectable to said first end of said support arm in said unloading position.

6. The seed or grain tender of claim 5, further comprising a latch for detachably connecting said first end of said conveyor to said first end of said support arm in said unloading position.

7. The seed or grain tender of claim 1, wherein said conveyor is rotatable in relation to said second coupling about a second horizontal axis of rotation.

8. The seed or grain tender of claim 7, wherein said second horizontal axis of rotation extends through said second coupling.

9. The seed or grain tender of claim 1, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.

10. The seed or grain tender of claim 1, wherein said first vertical axis extends through said first end of said support arm.

11. The seed or grain tender of claim 1, wherein said first vertical axis extends through said base.

12. The seed or grain tender of claim 1, wherein said second end of said support arm terminates at or near said approximate center of gravity of said conveyor.

13. The seed or grain tender of claim 1, wherein said first end of said support arm is fixed at a first height and said second end of said support arm is pivotable between a range of heights.

14. The seed or grain tender of claim 1, further comprising a lift device for adjusting a height of said second end of said support arm.

15. The seed or grain tender of claim 14, wherein said lift device is a pressurized cylinder.

16. The seed or grain tender of claim 14, wherein said lift device is a hydraulic cylinder.

17. The seed or grain tender of claim 1, wherein said first coupling is a U-shaped member with a horizontal base portion and a pair of upright portions, and wherein said first horizontal axis extends through said upright portions of said first coupling.

18. The seed or grain tender of claim 1, further comprising a locking mechanism for locking or unlocking said support arm in relation to said base.

19. The seed or grain tender of claim 18, wherein said locking mechanism includes a pin releasably engageable with one of a plurality of holes formed in said base.

20. The seed or grain tender of claim 19, wherein said pin is spring-biased toward said holes in said base.

21. The seed or grain tender of claim 19, wherein said internal elevator includes a motor-driven belt.

22. A seed or grain tender comprising:

a frame;

a main hopper mounted on said frame and having a main hopper discharge;

a base mounted on said frame below said main hopper discharge;

a support arm having first and second ends;

a first coupling connecting said first end of said support arm with said base, said first coupling being rotatable in relation to said base about a first vertical axis of rotation, and said first end of said support arm being rotatable in relation to said first coupling about a first horizontal axis of rotation;

a lift device extending from said base to a portion of said support arm between said first and second ends such that said support arm extends upwardly at an acute angle from said base;

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and a motor-driven elevator for moving seed or grain from said conveyor hopper to said conveyor discharge; and

a second coupling connecting said second end of said support arm with said conveyor at an approximate center of gravity of said conveyor, said second coupling defining a second vertical axis of rotation that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said second vertical axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper, wherein said conveyor is disposed parallel to and above said support arm in said unloading position; and

a locking mechanism for locking and unlocking said support arm in relation to said base.

23. The seed or grain tender of claim 22, wherein said conveyor is disposed above said support arm in said unloading position.

24. The seed or grain tender of claim 22, wherein said first end of said conveyor is detachably connectable to said first end of said support arm in said unloading position.

25. The seed or grain tender of claim 24, further comprising a latch for detachably connecting said first end of said conveyor to said first end of said support arm in said unloading position.

26. The seed or grain tender of claim 22, wherein said conveyor is rotatable in relation to said second coupling about a second horizontal axis of rotation.

27. The seed or grain tender of claim 26, wherein said second horizontal axis of rotation extends through said second coupling.

28. The seed or grain tender of claim 22, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.

29. The seed or grain tender of claim 22, wherein said first vertical axis extends through said first end of said support arm.

30. The seed or grain tender of claim 22, wherein said first vertical axis extends through said base.

31. The seed or grain tender of claim 22, wherein said second end of said support arm terminates at or near said approximate center of gravity of said conveyor.

32. The seed or grain tender of claim 22, wherein said first end of said support arm is fixed at a first height and said second end of said support arm is pivotable between a range of heights.

33. The seed or grain tender of claim 22, wherein said lift device is a pressurized cylinder.

34. The seed or grain tender of claim 22, wherein said lift device is a hydraulic cylinder.

35.The seed or grain tender of claim 22, wherein said first coupling is a U-shaped member with a horizontal base portion and a pair of upright portions, and wherein said first horizontal axis extends through said upright portions of said first coupling.

36. The seed or grain tender of claim 22, wherein said locking mechanism includes a pin releasably engageable with one of a plurality of holes formed in said base.

37. The seed or grain tender of claim 36, wherein said pin is spring-biased toward said holes in said base.

38. The seed or grain tender of claim 22, wherein said internal elevator includes a motor-driven belt.

ABSTRACT

A seed carrier includes a main hopper coupled with a frame via leg members. The main hopper has a discharge. A base plate is coupled with the frame. A support arm is rotatably coupled with the base plate at a first end. A belt driven conveyor having a conveyor hopper at a first end and a discharge at a second end is rotatably coupled with a second end of said support arm at an approximate center of gravity thereof. A latch mechanism is provided for detachably coupling the first end of the conveyor with the first end of the support arm such that the conveyor hopper is position below the main hopper discharge. When the conveyor is uncoupled from the first end of the support arm, the conveyor can rotate to a loading position wherein the discharge thereof can be positioned over the main hopper.

File History Content Report

The following content is missing from the original file history record obtained from the United States Patent and Trademark Office. No additional information is available.

Document Date - 2015-01-27

Document Title - Applicant Communication Re: Entity Status Set to Undiscounted (Initial Default Setting or Status Change)

This page is not part of the official USPTO record. It has been determined that content identified on this document is missing from the original file history record.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/606,794	01/27/2015	3652	0.00	1994-363US2	38	2

CONFIRMATION NO. 1047

6449
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

FILING RECEIPT

OC000000073257169

Date Mailed: 02/06/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Brian James PETERSEN, Ottawa, OH;
David Richard SMITH, Fort Jennings, OH;

Applicant(s)

UNVERFERTH MANUFACTURING COMPANY, INC., Kalida, OH

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 13/541,553 07/03/2012
which is a CON of 12/031,867 02/15/2008 PAT 8221047
which claims benefit of 60/901,321 02/15/2007

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 02/05/2015

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/606,794**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

Title

SEED CARRIER WITH PIVOTING CONVEYOR

Preliminary Class

414

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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NOT GRANTED

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/606,794	01/27/2015	Brian James PETERSEN	1994-363US2

CONFIRMATION NO. 1047

6449
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

FORMALITIES LETTER

OC000000073257170

Date Mailed: 02/06/2015

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Additional claim fees of $ **1440** as an undiscounted entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
  The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. No entity status discount is in effect. If applicant is qualified for small entity status, a written assertion of small entity status must be submitted to establish small entity status. (See 37 CFR 1.27). If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- $ **280** basic filing fee.
- $ **140** surcharge.
- $ **600** search fee.
- $ **720** examination fee.
- $ **1440** for **18** total claims over 20.

- $(0) previous unapplied payment amount.
- $ **3180** TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Brian James PETERSEN
  David Richard SMITH

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice". https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

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If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/zretta/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Electronic Acknowledgement Receipt	
EFS ID:	21976870
Application Number:	14606794
International Application Number:	
Confirmation Number:	1047
Title of Invention:	SEED CARRIER WITH PIVOTING CONVEYOR
First Named Inventor/Applicant Name:	Brian James PETERSEN
Customer Number:	6449
Filer:	Brian S. Rosenbloom/Carole Klavuhn
Filer Authorized By:	Brian S. Rosenbloom
Attorney Docket Number:	1994-363US2
Receipt Date:	06-APR-2015
Filing Date:	27-JAN-2015
Time Stamp:	14:58:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$3180
RAM confirmation Number	1238
Deposit Account	022135
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	1994-363US2-ResponsetoNOMP.pdf	111795	no	1
Warnings:					
Information:					
2	Oath or Declaration filed	1994-363US2-Decs.pdf	365674	no	2
Warnings:					
Information:					
3	Power of Attorney	1994-363US2-POA.pdf	410253	no	2
Warnings:					
Information:					
4		1994-363US2-IDS.pdf	1358905	yes	13

Multipart Description/PDF files in .zip description

Document Description	Start	End
Transmittal Letter	1	1
Information Disclosure Statement (IDS) Form (SB08)	2	13

Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	38922	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2285549		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 14/606,794
First Inventor : Brian James PETERSEN et al.
Filed : January 27, 2015
TC/A.U. : 3652
Examiner :

Docket No. : 1994-363US2
Customer No. : 06449
Confirmation No. : 1047

Mail Stop: Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

RESPONSE TO NOTICE TO FILE MISSING PARTS

In response to the Notice to File Missing Parts mailed February 6, 2015, the items checked below are attached in the order listed:

X	Fee transmittal itemizing payment of the fees enumerated thereon. If any additional payment is required, please charge such to Deposit Account No. 02-2135.
X	Information Disclosure Statement
X	A declaration executed by the inventor(s)
X	A power of attorney and Transmittal
	Other

Remarks:

X Customer Number or Bar Code Label **6449**					
Name	Brian S. Rosenbloom, Reg. No. 41,276				
Signature				*Date*	2015.7.06
Address	Rothwell, Figg, Ernst & Manbeck. p.c. Suite 800, 607 14th Street, N.W.				
City	Washington	*State*	D.C.	*Zip Code*	20005
Country	U.S.A.	*Telephone*	202-783-6040	*Fax*	202-783-6031

Rothwell, Figg, Ernst & Manbeck, P.C.
For applications filed on or after September 16, 2012

Attorney Docket No. 1994-363US2

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Caution: ***A person may not execute an oath or declaration for an application unless that person has reviewed and understands the contents of the application, including the claims, and is aware of the duty to disclose to the US Patent and Trademark Office all information known to the person to be material to patentability as defined in 37 CFR 1.56.***

Title of Invention	Seed Carrier With Pivoting Conveyor

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 14/606,794 filed on January 27, 2015.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

LEGAL NAME OF INVENTOR

Typed Name of Inventor: Brian James PETERSEN

Signature of Inventor: Brian James Petersen

Date (optional): 2-23-2015

Last Modified 2/18/2015

Rothwell, Figg, Ernst & Manbeck, P.C.
For applications filed on or after September 16, 2012

Attorney Docket No. 1994-363US2

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Caution: *A person may not execute an oath or declaration for an application unless that person has reviewed and understands the contents of the application, including the claims, and is aware of the duty to disclose to the US Patent and Trademark Office all information known to the person to be material to patentability as defined in 37 CFR 1.56.*

Title of Invention	Seed Carrier With Pivoting Conveyor

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 14/606,794 filed on January 27, 2015.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

LEGAL NAME OF INVENTOR

Typed Name of Inventor: David Richard SMITH

Signature of Inventor: David Richard Smith Date (optional): 2-23-15

Last Modified 2/18/2015

Rothwell, Figg, Ernst & Manbeck, P.C.

POWER OF ATTORNEY BY APPLICANT

(Note: this form MUST be accompanied by Transmittal Form to identify application to which this Power of Attorney is directed, or the Power of Attorney will not be recognized in the Application)

I hereby revoke all previous powers of attorney given in the application identified in the attached transmittal letter.

I hereby appoint Practitioners associated with the following Customer Number as my/our attorney(s) or agent(s), to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent): **Customer Number 06449.**

Please recognize or change the correspondence address for the above-identified application to the address associated with **Customer Number 06449.**

ACKNOWLEDGEMENT AND CONSENT TO OBTAIN INSTRUCTIONS FROM ANOTHER PARTY

The undersigned hereby acknowledges that the practitioners appointed herein may obtain instructions as to any action to be taken in the U.S. Patent and Trademark Office on any application to which this power of attorney may be directed, or on any patent which may issue on any such application, from third-party agents or attorneys of Applicant, who have been authorized by Applicant to convey such instructions, and Applicant expressly consents to this arrangement. In the event of a change in the persons from whom instructions are to be taken, the practitioners appointed herein shall be so notified by the Applicant.

I am the Applicant *(check one below)*:

	Inventor or Joint Inventor
	Legal Representative of a Deceased or Legally Incapacitated Inventor
X	Assignee or Person to Whom the Inventor is Under an Obligation to Assign
	Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document)

Signature of Applicant for Patent

Signature	R Steven Unverferth	**Date** 3-2-15
Typed/Printed Name	R. Steven Unverferth	
Title and Company	Pres. Unverferth Mfg Co Inc	

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

(Note: This form is to be submitted with the Power of Attorney by Applicant form to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5. If the Power of Attorney by Applicant form is not accompanied by this transmittal form or an equivalent, the Power of Attorney will not be recognized in the application.)

Application Number	14/606,794		
Filing Date	January 27, 2015		
First Named Inventor	Brian James Petersen et al.		
Title	SEED CARRIER WITH PIVOTING CONVEYOR		
Art Unit	3652		
Examiner Name			
Attorney Docket Number	1994-363US2	Client Ref. Number	

Signature of Patent Practitioner

Signature		Date 3-24-15
Name	Jason M. Shapiro	Telephone 202-783-6040
Registration Number	35,354	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	: 14/606,794
First Inventor	: Brian James PETERSEN et al.
Filed	: January 27, 2015
TC/A.U.	: 3652
Examiner	:
Docket No.	: 1994-363US2
Customer No.	: 06449
Confirmation No.	: 1047

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

Under the provisions of 37 C.F.R. §§ 1.56, 1.97 and 1.98, Applicants submit herewith Form PTO-SB08 and PTO-892 listing publications that the Office may wish to consider in examination of the subject application.

Pursuant to 1.98(d), copies of the references are not included because they were previously submitted to the Office in prior application Serial No. 13/541,553, and to which priority is or has been claimed under 35 USC § 120.

Respectfully submitted,

By _____

Brian S. Rosenbloom
Attorney for Applicants
Registration No. 41,276
ROTHWELL, FIGG, ERNST & MANBECK, p.c.
Suite 800, 607 14TH Street, N.W.
Washington, D.C. 20005
Telephone: (202)783-6040

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14606794
	Filing Date	2015-01-27
	First Named Inventor	Brian James PETERSEN et al.
	Art Unit	3652
	Examiner Name	
	Attorney Docket Number	1994-363US2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature		Date (YYYY-MM-DD)	2015-01-06
Name/Print	Brian S. Rosenbloom	Registration Number	41,276

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14606794
	Filing Date	2015-01-27
	First Named Inventor	Brian James PETERSEN et al.
	Art Unit	3652
	Examiner Name	
	Attorney Docket Number	1994-363US2

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	3090515		1963-05-21	Crowther	
	2	3493136		1970-02-03	Spellman, Jr.	
	3	3498483		1970-03-03	Meharry	
	4	4037745		1977-07-26	Hengen et al.	
	5	4411581		1983-10-25	Niewold	
	6	4742938		1988-05-10	Niewold	
	7	5520495		1996-05-28	Sukup	
	8	5718556		1998-02-17	Forsyth	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14606794
	Filing Date	2015-01-27
	First Named Inventor	Brian James PETERSEN et al.
	Art Unit	3652
	Examiner Name	
	Attorney Docket Number	1994-363US2

	9	3968771		1976-07-13	Walgenbach et al.	
	10	4503803		1985-03-12	Barnes	
	11	5800116		1998-09-01	Smith et al.	
	12	6209880		2001-04-03	Turnwald et al.	
	13	6325588		2001-12-04	Nolin	
	14	6604620		2003-08-12	Dennis	
	15	6767174		2004-07-27	Cresswell	
	16	7488149		2009-02-10	Waldner	
	17	7500817		2009-03-10	Furrer et al.	
	18	5529455		1996-06-25	Kaster et al.	
	19	7393275		2008-07-01	Voss et al.	

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	Art Unit	3652
	Examiner Name	
	Attorney Docket Number	1994-363US2

	20	5888044		1999-03-30	Baskerville	
	21	7267519		2007-09-11	Cresswell, et al.	
	22	7500814		2009-03-10	Meyer	
	23	4218169		1980-08-19	Arends	
	24	4274790		1981-06-23	Barker	
	25	4312621		1982-01-26	Quanbeck et al.	
	26	4419037		1983-12-06	Neiwold	
	27	4491216		1985-01-01	Sawby	
	28	4613275		1986-09-23	Karlowsky	
	29	5013208		1991-05-07	Grieshop	
	30	5468113		1995-11-21	Davis	

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	Filing Date	2015-01-27
	First Named Inventor	Brian James PETERSEN et al.
	Art Unit	3652
	Examiner Name	
	Attorney Docket Number	1994-363US2

	31	5516253		1996-05-14	Linscheid et al.	
	32	5538388		1996-07-23	Bergkamp et al.	
	33	5582221		1996-12-10	Smith et al.	
	34	5615990		1997-04-01	Grieshop	
	35	5785481		1998-07-28	Ockels	
	36	5980189		1999-11-09	Rubner	
	37	6120233		2000-09-19	Adam	
	38	6908380		2005-06-21	Silver	
	39	7223059		2007-05-29	Smith et al.	
	40	7553228		2009-06-30	Dillon	
	41	6113339		2000-09-05	Adams	

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	Filing Date	2015-01-27
	First Named Inventor	Brian James PETERSEN et al.
	Art Unit	3652
	Examiner Name	
	Attorney Docket Number	1994-363US2

	42	5484249		1996-01-16	Klatt	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20030057055		2003-03-27	Haukaas et al.	
	2	20060180062		2006-04-17	Furrer et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Model 2300 Air System and the Model 4800 Air Drill, both made and sold by Concord, as illustrated in the Concord brochure, 12 pages.	☐
	2	Convey-All, BTS 290 Seed Tender Product Specification, 2 pages.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2015-01-27
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	Art Unit	3652
	Examiner Name	
	Attorney Docket Number	1994-363US2

	3	Convey-All Ind. Inc., Engineering Drawings of BT-1500, 4 pages.	☐
	4	Par-Kan Company, Engineering Drawings, 2 pages.	☐
	5	Great Plains Manufacturing, Inc., Parts Manual - Model ADC2220 Air Drill Cart, May 1, 1997, 61 pages.	☐
	6	Great Plains Manufacturing, Inc., Parts Manual - Model ADC2220 Air Drill Cart, March 1, 2000, 69 pages.	☐
	7	Reexamination File History for Control Number 95000691, 374 pages.	☐
	8	Order Denying Request for Inter Partes Reexamination for Control Number 95000691, November 7, 2012, 15 pages.	☐
	9	Par-Kan Company, Final Invalidity Contentions submitted in Unverferth Mfg. Co., Inc. v. Par-Kan Co., Civil Action No. 13-cv-00097 (N.D. Ind.), October 25, 2013, 130 pages.	☐
	10	Par-Kan Company, Preliminary Invalidity Contentions submitted in Unverferth Mfg. Co., Inc. v. Par-Kan Co., Civil Action No. 13-cv-00097 (N.D. Ind.), June 17, 2013, 169 pages.	☐
	11	Declaration of Shawn Gerdeman with Exhibits A-E dated September 18, 2014, 24 pages.	☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14606794
	Filing Date	2015-01-27
	First Named Inventor	Brian James PETERSEN et al.
	Art Unit	3652
	Examiner Name	
	Attorney Docket Number	1994-363US2

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Other Prior Art

According to the information contained in form PTO-1449 or PTO-892, there are one or more other prior art/non-patent literature documents missing from the original file history record obtained from the United States Patent and Trademark Office. Upon your request we will attempt to obtain these documents from alternative resources. Please note that additional charges will apply for this service.

This page is not part of the official USPTO record. It has been determined that content identified on this document is missing from the original file history record.

FOR SN. 14/606,794

Notice of References Cited	Application/Control No. ~~10/541,853~~	Applicant(s)/Patent Under Reexamination PETERSEN ET AL.	
	Examiner GLENN MYERS	Art Unit 3652	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,120,233	09-2000	Adam, Gerald E.	414/502
*	B	US-5,718,556	02-1998	Forsyth, Daniel L.	414/503
*	C	US-5,520,495	05-1996	Sukup, Eugene G.	414/523
*	D	US-3,498,483	03-1970	MEHARRY JAMES L	414/523
*	E	US-1,905,434	04-1933	FERNAND BOYER	414/328
*	F	US-5,484,249	01-1996	Klatt, Dennis	414/523
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

FOR SN. 14/606,794

Notice of References Cited	Application/Control No. ~~13/641,553~~	Applicant(s)/Patent Under Reexamination PETERSEN ET AL.	
	Examiner JOSHUA RUDAWITZ	Art Unit 3652	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-427,736 A	05-1890	Bufkin	198/317
*	B	US-3,968,771 A	07-1976	Walgenbach et al.	118/303
*	C	US-3,994,512 A	11-1976	Parker et al.	280/687
*	D	US-3,997,215 A	12-1976	Parker et al.	298/24
*	E	US-4,503,803 A	03-1985	Barnes, Ronald A.	118/303
*	F	US-5,615,990 A	04-1997	Grieshop, Maurice	414/526
*	G	US-5,800,116 A	09-1998	Smith et al.	414/523
*	H	US-5,888,044 A	03-1999	Baskerville, Gregory Eugene	414/523
*	I	US-6,209,880 B1	04-2001	Turnwald et al.	277/402
*	J	US-6,325,588 B1	12-2001	Nolin, Karl W.	414/526
*	K	US-2003/0057055 A1	03-2003	Haukaas et al.	198/313
*	L	US-6,604,620 B2	08-2003	Dennis, Andrew	198/312
*	M	US-6,767,174 B2	07-2004	Cresswell, Mark	414/523

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

FOR S.N. 14/606,794

Notice of References Cited	Application/Control No. ~~13/541,553~~	Applicant(s)/Patent Under Reexamination PETERSEN ET AL.	
	Examiner JOSHUA RUDAWITZ	Art Unit 3652	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,428,956 B2	09-2008	Scherman, Patrick John	198/312
*	B	US-7,488,149 B2	02-2009	Waldner, Samuel	414/532
*	C	US-7,500,817 B2	03-2009	Furrer et al.	414/522
*	D	US-2009/0110524 A1	04-2009	Hoffmann, Mark A.	414/507
*	E	US-8,221,047 B2	07-2012	Petersen et al.	414/523
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Electronic Patent Application Fee Transmittal				
Application Number:	14606794			
Filing Date:	27-Jan-2015			
Title of Invention:	SEED CARRIER WITH PIVOTING CONVEYOR			
First Named Inventor/Applicant Name:	Brian James PETERSEN			
Filer:	Brian S. Rosenbloom/Carole Klavuhn			
Attorney Docket Number:	1994-363US2			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
Pages:				
Claims:				
Claims in Excess of 20	1202	18	80	1440
Miscellaneous-Filing:				
Late Filing Fee for Oath or Declaration	1051	1	140	140

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		3180

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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/606,794	01/27/2015	Brian James PETERSEN	1994-363US2

CONFIRMATION NO. 1047

POA ACCEPTANCE LETTER

6449
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

Date Mailed: 04/10/2015

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/06/2015.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/dgela/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/606,794	01/27/2015	3652	3180	1994-363US2	38	2

CONFIRMATION NO. 1047

UPDATED FILING RECEIPT

6449
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

OC000000074521475

Date Mailed: 04/10/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Brian James PETERSEN, Ottawa, OH;
David Richard SMITH, Fort Jennings, OH;

Applicant(s)

UNVERFERTH MANUFACTURING COMPANY, INC., Kalida, OH

Power of Attorney: The patent practitioners associated with Customer Number 06449

Domestic Priority data as claimed by applicant

This application is a CON of 13/541,553 07/03/2012 PAT 8967940
which is a CON of 12/031,867 02/15/2008 PAT 8221047
which claims benefit of 60/901,321 02/15/2007

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 02/05/2015

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/606,794**

Projected Publication Date: 07/16/2015

Non-Publication Request: No

Early Publication Request: No

Title

SEED CARRIER WITH PIVOTING CONVEYOR

Preliminary Class

414

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

Electronic Acknowledgement Receipt	
EFS ID:	22303958
Application Number:	14606794
International Application Number:	
Confirmation Number:	1047
Title of Invention:	SEED CARRIER WITH PIVOTING CONVEYOR
First Named Inventor/Applicant Name:	Brian James PETERSEN
Customer Number:	6449
Filer:	Jason M. Shapiro/Carole Klayuhn
Filer Authorized By:	Jason M. Shapiro
Attorney Docket Number:	1994-363US2
Receipt Date:	11-MAY-2015
Filing Date:	27-JAN-2015
Time Stamp:	13:48:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Preliminary Amendment	1994-363US2-PreAmd.pdf	483232	no	8
Warnings:					
Information:					

Total Files Size (in bytes):	483232

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	: 14/606,794
First Named Inventor	: Brian James PETERSEN et al.
Filed	: January 27, 2015
TC/A.U.	: 3652
Examiner	:
Docket No.	: 1994-363US2
Customer No.	: 06449
Confirmation No.	: 1047

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

PRELIMINARY AMENDMENT

Please amend the above-identified application, prior to examination on the merits, as follows:

Amendments to the claims begin on page 2 of this paper.

Remarks are on page 8 of this paper.

Amendments to the Claims:

Cancel claims 1-38, and insert the following claims:

39. (New) A seed or grain tender comprising:

a main hopper having a main hopper discharge;

a support arm having first and second ends;

said first end of said support arm being located below said main hopper and being rotatable about a first axis of rotation, and said first end of said support arm being rotatable about a second axis of rotation that is perpendicular to said first axis of rotation;

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge; and

said second end of said support arm being coupled with said conveyor between said first and second ends of said conveyor, said conveyor being rotatable about a third axis of rotation at said second end of said support arm that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said third of axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper.

40. (New) The seed or grain tender of claim 39, wherein said first axis of rotation extends through said main hopper discharge.

41. (New) The seed or grain tender of claim 39, wherein said second axis of rotation extends through said first end of said support arm.

42. (New) The seed or grain tender of claim 39, wherein said third axis of rotation extends through said conveyor.

43. (New) The seed or grain tender of claim 39, wherein said third axis of rotation extends through said second end of said support arm.

44. (New) The seed or grain tender of claim 39, wherein said third axis of rotation extends through said conveyor and said second end of said support arm.

45. (New) The seed or grain tender of claim 39, wherein said third axis of rotation is oriented at an angle having a vertical component.

46. (New) The seed or grain tender of claim 39, wherein said second end of said support arm is coupled with said conveyor at or near said approximate center of gravity of said conveyor.

47. (New) The seed or grain tender of claim 39, further comprising a hydraulic piston extending at an acute angle relative to a horizontal plane to connect with a portion of said support arm spaced from said second axis of rotation.

48. (New) The seed or grain tender of claim 39, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.

49. (New) A seed or grain tender comprising:

a main hopper having an upper portion with a main hopper intake opening and a lower portion with a main hopper discharge;

a support arm having a first end proximate said lower portion of said main hopper and a second end;

wherein said support arm is pivotable about a first axis of rotation proximate said first end of said support arm to cause said support arm to be movable between an operating position wherein said support arm extends outwardly relative to said main hopper and a storage position wherein said support arm is folded inwardly towards said main hopper in relation to said operating position, said support arm further being pivotable about a second axis of rotation proximate said first end of said support arm to cause an elevation of said second end of said support arm to be

adjustable;

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge; and

said second end of said support arm being coupled with said conveyor between said first and second conveyor ends, said conveyor being rotatable about a third axis of rotation proximate said second end of said support arm that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said third of axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said intake opening of said main hopper to dispense agricultural product into said main hopper.

50. (New) The seed or grain tender of claim 49, wherein said first axis of rotation extends through said main hopper discharge.

51. (New) The seed or grain tender of claim 49, wherein said second axis of rotation extends through said first end of said support arm.

52. (New) The seed or grain tender of claim 49, wherein said third axis of rotation extends through said conveyor.

53. (New) The seed or grain tender of claim 49, wherein said third axis of rotation extends through said second end of said support arm.

54. (New) The seed or grain tender of claim 49, wherein said third axis of rotation extends through said conveyor and said second end of said support arm.

55. (New) The seed or grain tender of claim 49, wherein said third axis of rotation is oriented at an angle having a vertical component.

56 (New) The seed or grain tender of claim 55, wherein said first axis of rotation is vertical.

57 (New) The seed or grain tender of claim 56, wherein said second axis of rotation is horizontal.

58. (New) The seed or grain tender of claim 49, wherein said second end of said support arm is coupled with said conveyor at an approximate center of gravity of said conveyor.

59. (New) The seed or grain tender of claim 49, further comprising a hydraulic piston extending at an acute angle relative to a horizontal plane to connect with a portion of said support arm spaced from said second axis of rotation.

60. (New) The seed or grain tender of claim 49, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.

REMARKS

Claims 1-38 are cancelled. Claims 39-60 are added. No new matter has been added. Early and favorable examination is respectfully requested.

Respectfully submitted,

By /Jason M. Shapiro/
Jason M. Shapiro
Attorney for Applicants
Registration No. 35,354
ROTHWELL, FIGG, ERNST & MANBECK, p.c.
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Washington, D.C. 20005
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2471809

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/606,794	01/27/2015	Brian James PETERSEN	1994-363US2

CONFIRMATION NO. 1047

6449
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

PUBLICATION NOTICE



Title:SEED CARRIER WITH PIVOTING CONVEYOR

Publication No.US-2015-0197395-A1
Publication Date:07/16/2015

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/606,794	01/27/2015	Brian James PETERSEN	1994-363US2	1047

6449 7590 01/26/2017

ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

EXAMINER	
BERRY JR, WILLIE WENDELL	

ART UNIT	PAPER NUMBER
3652	

NOTIFICATION DATE	DELIVERY MODE
01/26/2017	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

Office Action Summary	Application No. 14/606,794	Applicant(s) PETERSEN ET AL.	
	Examiner WILLIE BERRY JR	Art Unit 3652	AIA (First Inventor to File) Status No

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *1/27/15*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *39-60* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☒ Claim(s) *49-60* is/are allowed.

7)☒ Claim(s) *39-46 and 48* is/are rejected.

8)☒ Claim(s) *47* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words in length. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc. In addition, the form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided.

In the instant case, the abstract is objected to for its use of legal phraseology, "said."

Claim Rejections - 35 USC § 102

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any

correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim(s) 39-44 is/are rejected under pre-AIA 35 U.S.C. 102(e) as being anticipated by patent no. 7,500,817 to Furrer et al.

Regarding claim 39, Furrer et al. discloses a seed or grain tender comprising: a main hopper (13) having a main hopper discharge (49); a support arm having first and second ends (not numbered, but shown in fig. 1A; note: the support is shown next to element [30] and attached to element [31]); said first end of said support arm being located below said main hopper and being rotatable about a first axis of rotation (not numbered, but shown in fig. 1A; note: first axis of rotation is the axis of rotation of the element [28]), and said first end of said support arm being rotatable about a second axis of rotation (not numbered, but shown in fig. 1A; note: the axis about which the support arm pivots is the second axis of rotation) that is perpendicular to said first axis of rotation; a conveyor (col. 4, lines 29-38) having a longitudinal axis and first and second ends, a conveyor hopper (34) at said first end, a conveyor discharge (36) at said second

end, and an internal elevator (col. 4, lines 29-38) for moving seed or grain from said conveyor hopper to said conveyor discharge; and said second end of said support arm being coupled with said conveyor between said first and second ends of said conveyor, said conveyor being rotatable about a third axis of rotation at said second end of said support arm that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said third of axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper (not numbered, but shown in figures 1 and 3).

Regarding claim 40, Furrer et al. discloses the seed or grain tender of claim 39, wherein said first axis of rotation extends through said main hopper discharge (not numbered, but shown in fig. 1).

Regarding claim 41, Furrer et al. discloses the seed or grain tender of claim 39, wherein said second axis of rotation extends through said first end of said support arm (not numbered, but shown in fig. 1A).

Regarding claim 42, Furrer et al. discloses the seed or gain tender of claim 39, wherein said third axis of rotation extends through said conveyor (not numbered, but shown in fig. 2).

Regarding claim 43, Furrer et al. discloses the seed or gain tender of claim 39, wherein said third axis of rotation extends through said second end of said support arm (not numbered, but shown in fig. 2).

Regarding claim 44, Furrer et al. discloses as discussed in previous response to claims 42 and 43.

Claim Rejections - 35 USC § 103

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 45 and 46 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Furrer et al.

Regarding claim 45, Furrer et al. discloses the claimed invention except for the axis of rotation having an angle with a vertical component.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided the axis of rotation oriented at an angle having a vertical component, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 46, Furrer et al. discloses the claimed invention except for the specific location of the support arm.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have placed the support arm near the center of gravity of the conveyor, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Claims 48 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Furrer et al. in view of patent no. 5,888,044 to Baskerville.

Regarding claim 48, Furrer et al. discloses the claimed invention except for the stand.

Baskerville discloses that it is known to have a stand (73) in a seed cart.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified Furrer et al. with the teachings of Baskerville for the purpose of enhancing versatility of the seed cart.

Allowable Subject Matter

Claims 49-60 are allowed.

Claim 47 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: The prior art does not show separately or in combination the detailed embodiment of a seed or grain tender comprising: a support arm having a first end proximate said lower portion of said main hopper and a second end; wherein said support arm is pivotable about a first axis

of rotation proximate said first end of said support arm to cause said support arm to be movable between an operating position wherein said support arm extends outwardly relative to said main hopper and a storage position wherein said support arm is folded inwardly towards said main hopper in relation to said operating position, said support arm further being pivotable about a second axis of rotation proximate said first end of said support arm to cause an elevation of said second end of said support arm to be adjustable;

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIE BERRY JR whose telephone number is (571)272-6191. The examiner can normally be reached on Mon-Fri, 11:30-8pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Saul Rodriguez can be reached on (571)272-7097. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SAUL RODRIGUEZ/
Supervisory Patent Examiner, Art Unit 3652

Wbj.

Notice of References Cited	Application/Control No. 14/606,794	Applicant(s)/Patent Under Reexamination PETERSEN ET AL.	
	Examiner WILLIE BERRY JR	Art Unit 3652	Page 1 of 1

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*	A	US-7,500,817 B2	03-2009	Furrer; G. Jason	A01C15/003	198/311
*	B	US-5,888,044 A	03-1999	Baskerville; Gregory Eugene	B60P1/42	198/311
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	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
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	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14606794
	Filing Date	2015-01-27
	First Named Inventor	Brian James PETERSEN et al.
	Art Unit	3652
	Examiner Name	
	Attorney Docket Number	1994-363US2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/BSR/	Date (YYYY-MM-DD)	2015-04-06
Name/Print	Brian S. Rosenbloom	Registration Number	41,276

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

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Filing Date	2015-01-27
First Named Inventor	Brian James PETERSEN et al.
Art Unit	3652
Examiner Name	
Attorney Docket Number	1994-363US2

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	Examiner Name	
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	Examiner Name	
	Attorney Docket Number	1994-363US2

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20030057055		2003-03-27	Haukaas et al.	
	2	20060180062		2006-04-17	Furrer et al.	

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Model 2300 Air System and the Model 4800 Air Drill, both made and sold by Concord, as illustrated in the Concord brochure, 12 pages.	☐
	2	Convey-All, BTS 290 Seed Tender Product Specification, 2 pages.	☐

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	Art Unit	3652
	Examiner Name	
	Attorney Docket Number	1994-363US2

	3	Convey-All Ind. Inc., Engineering Drawings of BT-1500, 4 pages.	☐
	4	Par-Kan Company, Engineering Drawings, 2 pages.	☐
	5	Great Plains Manufacturing, Inc., Parts Manual - Model ADC2220 Air Drill Cart, May 1, 1997, 61 pages.	☐
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EXAMINER SIGNATURE

Examiner Signature	/WILLIE W BERRY JR/	Date Considered	01/09/2017

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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	Attorney Docket Number	1994-363US2

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FOR SN. 14/606,794

Notice of References Cited	Application/Control No. ~~10/541,853~~	Applicant(s)/Patent Under Reexamination PETERSEN ET AL.	
	Examiner GLENN MYERS	Art Unit 3652	Page 1 of 1

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FOR SN. 14/606,794

Notice of References Cited	Application/Control No. ~~13/641,553~~	Applicant(s)/Patent Under Reexamination PETERSEN ET AL.	
	Examiner JOSHUA RUDAWITZ	Art Unit 3652	Page 1 of 2

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*	K	US-2003/0057055 A1	03-2003	Haukaas et al.	198/313
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	P					
	Q					
	R					
	S					
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FOR S.N. 14/606,794

Notice of References Cited	Application/Control No. ~~13/541,553~~	Applicant(s)/Patent Under Reexamination PETERSEN ET AL.	
	Examiner JOSHUA RUDAWITZ	Art Unit 3652	Page 2 of 2

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*	B	US-7,488,149 B2	02-2009	Waldner, Samuel	414/532
*	C	US-7,500,817 B2	03-2009	Furrer et al.	414/522
*	D	US-2009/0110524 A1	04-2009	Hoffmann, Mark A.	414/507
*	E	US-8,221,047 B2	07-2012	Petersen et al.	414/523
	F	US-			
	G	US-			
	H	US-			
	I	US-			
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Electronic Acknowledgement Receipt	
EFS ID:	29031608
Application Number:	14606794
International Application Number:	
Confirmation Number:	1047
Title of Invention:	SEED CARRIER WITH PIVOTING CONVEYOR
First Named Inventor/Applicant Name:	Brian James PETERSEN
Customer Number:	6449
Filer:	George R. Repper/Marilyn Davis
Filer Authorized By:	George R. Repper
Attorney Docket Number:	1994-363US2
Receipt Date:	26-APR-2017
Filing Date:	27-JAN-2015
Time Stamp:	13:51:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$180
RAM confirmation Number	042717INTEFSW13534000
Deposit Account	022135
Authorized User	Marilyn Davis
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	1194_363US2Response.pdf	109572	no	10
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	1994_363US2SB08.PDF	1035763	no	5
Warnings:					
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3	Foreign Reference	FR2465667.pdf	5219002	no	7
Warnings:					
Information:					
4	Foreign Reference	TranslationofFR2465667.pdf	4352896	no	7
Warnings:					
Information:					
5	Foreign Reference	CA2416677.pdf	9303918	no	17
Warnings:					
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6	Non Patent Literature	NPL1_HinikerModel4836OperatorManual.pdf	9987099	no	58
Warnings:					
Information:					
7	Non Patent Literature	NPL2_HinikerModel4831AssemblyManual.pdf	8306400	no	49
Warnings:					
Information:					
8	Non Patent Literature	NPL3_HinikerModel4831ProductSheet.pdf	231205	no	1
Warnings:					
Information:					
9	Non Patent Literature	NPL4_HinikerFillAugerSupportAssembly.pdf	228633	no	1
Warnings:					
Information:					
10	Non Patent Literature	NPL5_HinikerCompany4800SoybeanPlanter.pdf	2808363	no	6
Warnings:					
Information:					
11	Non Patent Literature	NPL7_AnnotatedPhotographsofHinikerAirSeederCart.pdf	4843229	no	8
Warnings:					
Information:					
12	Non Patent Literature	NPL8_GreatPlainsManufacturing220BushelAirCart.pdf	800111	no	2
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Information:					

13	Non Patent Literature	NPL9_J_M_sAmendedInitialInvalidityContentions_February_7_2017.pdf	210095	no	59
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14	Non Patent Literature	NPL_6a_HinkerCompanyProductPhotographs.pdf	23348084	no	33
Warnings:					
Information:					
15	Non Patent Literature	NPL_6b_HinkerCompanyProductPhotographs.pdf	24098469	no	34
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16	Fee Worksheet (SB06)	fee-info.pdf	31005	no	2
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
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If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	14/606,794
First Named Inventor	:	Brian James PETERSEN
Filed	:	January 27, 2015
TC/A.U.	:	3652
Examiner	:	Willie Wendell Berry Jr.
Docket No.	:	1994-363.US2
Customer No.	:	06449
Confirmation No.	:	1047

RESPONSE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the non-final Office Action mailed January 26, 2017, Applicant respectfully requests consideration of the remarks contained on the following pages. This paper is being timely filed on or before April 26, 2017. Authorization is hereby given to charge Deposit Account No. 02-2135 for any fees deemed necessary.

Amendments to the Specification begin on page 2 of this paper

Amendments to the Claims begin on page 3 of this paper

Remarks begin on page 8 of this paper.

AMENDMENTS TO THE SPECIFICATION

Please amend the Abstract in the specification as follows (deletions are double bracketed and additions are underlined):

A seed carrier includes a main hopper coupled with a frame via leg members. The main hopper has a discharge. A base plate is coupled with the frame. A support arm is rotatably coupled with the base plate at a first end. A belt driven conveyor having a conveyor hopper at a first end and a discharge at a second end is rotatably coupled with a second end of **[[**said**]]** the support arm at an approximate center of gravity thereof. A latch mechanism is provided for detachably coupling the first end of the conveyor with the first end of the support arm such that the conveyor hopper is position below the main hopper discharge. When the conveyor is uncoupled from the first end of the support arm, the conveyor can rotate to a loading position wherein the discharge thereof can be positioned over the main hopper.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-38. (Cancelled)

39. (Currently Amended) A seed or grain tender comprising:

a main hopper having a main hopper discharge;

a support arm having first and second ends;

said first end of said support arm being located below said main hopper and being rotatable about a first axis of rotation, and said first end of said support arm being rotatable about a second axis of rotation that is perpendicular to said first axis of rotation;

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge; **[[and]]**

said second end of said support arm being coupled with said conveyor between said first and second ends of said conveyor, said conveyor being rotatable about a third axis of rotation at said second end of said support arm that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said third of axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper, and

a hydraulic piston extending at an acute angle relative to a horizontal plane to connect with a portion of said support arm spaced from said second axis of rotation.

40. (Previously Presented) The seed or grain tender of claim 39, wherein said first axis of rotation extends through said main hopper discharge.

41. (Previously Presented) The seed or grain tender of claim 39, wherein said second axis of rotation extends through said first end of said support arm.

42. (Previously Presented) The seed or grain tender of claim 39, wherein said third axis of rotation extends through said conveyor.

43. (Previously Presented) The seed or grain tender of claim 39, wherein said third axis of rotation extends through said second end of said support arm.

44. (Previously Presented) The seed or grain tender of claim 39, wherein said third axis of rotation extends through said conveyor and said second end of said support arm.

45. (Previously Presented) The seed or grain tender of claim 39, wherein said third axis of rotation is oriented at an angle having a vertical component.

46. (Previously Presented) The seed or grain tender of claim 39, wherein said second end of said support arm is coupled with said conveyor at or near said approximate center of gravity of said conveyor.

47. (Cancelled)

48. (Previously Presented) The seed or grain tender of claim 39, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.

49. (Previously Presented) A seed or grain tender comprising:

a main hopper having an upper portion with a main hopper intake opening and a lower portion with a main hopper discharge;

a support arm having a first end proximate said lower portion of said main hopper and a second end;

wherein said support arm is pivotable about a first axis of rotation proximate said first end of said support arm to cause said support arm to be movable between an operating position wherein said support arm extends outwardly relative to said main hopper and a storage position wherein said support arm is folded inwardly towards said main hopper in relation to said operating position, said support arm further being pivotable about a second axis of rotation proximate said first end of said support arm to cause an elevation of said second end of said support arm to be adjustable;

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge; and

said second end of said support arm being coupled with said conveyor between said first and second conveyor ends, said conveyor being rotatable about a third axis of rotation proximate

said second end of said support arm that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said third of axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said intake opening of said main hopper to dispense agricultural product into said main hopper.

50. (Previously Presented) The seed or grain tender of claim 49, wherein said first axis of rotation extends through said main hopper discharge.

51. (Previously Presented) The seed or grain tender of claim 49, wherein said second axis of rotation extends through said first end of said support arm.

52. (Previously Presented) The seed or grain tender of claim 49, wherein said third axis of rotation extends through said conveyor.

53. (Previously Presented) The seed or grain tender of claim 49, wherein said third axis of rotation extends through said second end of said support arm.

54. (Previously Presented) The seed or grain tender of claim 49, wherein said third axis of rotation extends through said conveyor and said second end of said support arm

55. (Previously Presented) The seed or grain tender of claim 49, wherein said third axis of rotation is oriented at an angle having a vertical component.

56 (Previously Presented) The seed or grain tender of claim 55, wherein said first axis of rotation is vertical.

57 (Previously Presented) The seed or grain tender of claim 56, wherein said second axis of rotation is horizontal.

58. (Previously Presented) The seed or grain tender of claim 49, wherein said second end of said support arm is coupled with said conveyor at an approximate center of gravity of said conveyor.

59. (Previously Presented) The seed or grain tender of claim 49, further comprising a hydraulic piston extending at an acute angle relative to a horizontal plane to connect with a portion of said support arm spaced from said second axis of rotation.

60. (Previously Presented) The seed or grain tender of claim 49, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.

REMARKS

The non-final Office Action dated January 26, 2017, has been received and carefully reviewed. The preceding amendments and following remarks form a full and complete response thereto. Claim 39 has been amended. Specifically, claim 39 has been amended to incorporate the subject matter of claim 47, which was indicated as containing allowable subject matter. In view of the amendment to claim 39, claim 47 has been cancelled. Claims 39-46 and 48-60 are currently pending. Reconsideration of all outstanding rejections is respectfully requested in view of the following remarks.

Allowable Subject Matter

Applicants would like to thank the Examiner for the indication of allowable subject matter. In the Office Action, claims 49-60 were allowed. Further, claim 47 was indicated as being directed to allowable subject matter and allowable if rewritten in independent form. The subject matter of dependent claim 47 has been incorporated into independent claim 39 for the sole purpose of advancing prosecution. Thus, claim 39 now recites the subject matter of claim 47 in independent form. Moreover, claims 40-46 and 49 depend from claim 39. Accordingly, Applicant submits that all pending claims are in condition for allowance.

Objection to the Specification

The abstract was objected to for its use of the term "said," which was alleged to be legal phraseology. For purposes of advancing prosecution, the abstract has been amended to replace the term "said" with the word "the." Thus, Applicant respectfully requests withdrawal of the objection to the specification.

Response to Rejections Under 35 U.S.C. § 103

Claims 39-44 were rejected under pre-AIA 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,500,817 to Furrer et al. ("Furrer"). Claims 45 and 46 were rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Furrer. Finally, claim 48 was rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Furrer in view of U.S. Patent No. 5,888,044 to Baskerville ("Baskerville"). Applicant respectfully submits that the claimed invention is neither anticipated by nor obvious over the cited art.

While Applicant disagrees with the rejection, claim 39 has been amended to incorporate the subject matter of claim 47 for the purpose of advancing prosecution, as claim 47 was not rejected and was indicated as containing allowable subject matter. Accordingly, Applicant respectfully submits that amended claim 39 is patentable over the cited art. Moreover, as claims 40-46 and 49 depend from claim 39, these claims are also patentable over the cited art. Therefore, Applicant respectfully requests withdrawal of the rejections under 35 U.S.C. §§ 102 and 103.

Conclusion

All of the stated grounds of rejections have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections, and that they be withdrawn. Applicants respectfully submit that present claims 39-46 and 48-60 are now in condition for allowance.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the Applicants'

undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

Respectfully submitted,

By /George R. Repper/

George R. Repper
Attorney for Applicants
Registration No. 31,414
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W., Suite 800
Washington, D.C. 20005
Telephone: (202)783-6040

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14606794
	Filing Date	2015-01-27
	First Named Inventor	Brian James PETERSEN
	Art Unit	3652
	Examiner Name	Willie Wendell Berry Jr.
	Attorney Docket Number	1994-363.US2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/George R. Repper/	Date (YYYY-MM-DD)	2017-04-26
Name/Print	George R. Repper	Registration Number	31,414

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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(Not for submission under 37 CFR 1.99)

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First Named Inventor	Brian James PETERSEN
Art Unit	3652
Examiner Name	Willie Wendell Berry Jr.
Attorney Docket Number	1994-363.US2

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	Hiniker Company, Model 4836 Air Seeder Cart with 4800 Air Drill Front Folding Toolbar, Operator's Manual, January 1999, 58 pages.	
	2	Hiniker Company, Models 4831, 4832, and 4833 Air Seeder Cart with 4800 Air Seeder Front Folding Toolbar, Assembly Manual, January 2000, 49 pages.	
	3	Hiniker 4831, 4832, 4833 Air Seeder, July 21, 1999, 1 page.	
	4	Hiniker Company, Fill Auger Support Assembly, 1 page.	
	5	Hiniker Company, 4800 Soybean Planter Marketing Material, 6 pages.	
	6	Hiniker Company, Product Photographs, 67 pages.	
	7	J&M Manufacturing Company, Inc., Annotated Photographs of Hiniker Company 4836 Air Seed Cart, 8 pages.	
	8	Great Plains Manufacturing, 220 Bushel Air Cart, 2 pages.	
	9	J&M Manufacturing Company, Inc., J&M Mfg. Co., Inc.'s Amended Initial Invalidity Contentions submitted in Unverferth Mfg. Co., Inc. v. J&M Mfg. Co., Inc., Civil Action No. 3:16-cv-02282-JZ (N.D. Ohio), February 7, 2017, 59 pages.	

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	First Named Inventor	Brian James PETERSEN
	Art Unit	3652
	Examiner Name	Willie Wendell Berry Jr.
	Attorney Docket Number	1994-363.US2

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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HINIKER

MODEL 4836
AIR SEEDER CART WITH
4800 AIR DRILL
FRONT FOLDING TOOLBAR

OPERATOR'S MANUAL

DO NOT USE OR OPERATE THIS EQUIPMENT UNTIL THIS MANUAL HAS BEEN READ AND THOROUGHLY UNDERSTOOD

PART NUMBER 80305341

JM-22-0000310

DELIVERY REPORT

Dealer & Customer Note: This check list must be executed in entirety at time of retail and returned by the dealer to Hiniker Company for warranty validation.

PRE DELIVERY SERVICE & INSPECTION

- ☐ Are the drill units correctly spaced for customer's row spacing?
- ☐ Are all hydraulic fittings, hoses and hydraulic cylinder connections tight?
- ☐ Is all captive air removed from hydraulic cylinders and hydraulic system?
- ☐ Has machine been checked for any loose hardware?
- ☐ Are all decals and S.M.V. sign clean and undamaged?

Dealer Name: _____

Dealer Address: _____ State _____ Zip _____

Phone (____) _____

Pre Delivery By: _____

DELIVERY TO CUSTOMER

- ☐ Show and explain each CAUTION, WARNING and DANGER machine decal.
- ☐ Insure customer understands safety hazards related to each decal.
- ☐ Explain to customer NOTICE and IMPORTANT machine instructions.
- ☐ Show customer frequent safety related copy throughout Operator's Manuals.
- ☐ Lead customer through full lubrication requirements.
- ☐ Show customer TROUBLE SHOOTING Section in Operator's Manual.
- ☐ Emphasize to customer the importance of COULTER and SEED placement. Show how to adjust the 4800 Air Drill for seed depth, seed shoe and seed rotary closer.
- ☐ Emphazise to customer need to read, and understand, Operator's Manual BEFORE STARTING MACHINE!
- ☐ Emphasize to customer the importance of knowing how to calibrate the seed metering equipment.
- ☐ Emphasize to customer the importance of safety in knowing how to hitch up to hitch and unhitch 4836 trailer.
- ☐ Explain to customer the Hiniker Company Warranty coverage.

The above items were reviewed with me at time of delivery.

Customer's Signature _____

Customer's Address _____ State _____ Zip _____

Phone (____) _____

☐ 1st Copy— Send to Hiniker Company

JM-22-0000311

Stamp

Hiniker Company
Attn: Warranty Dept.
Airport Road
P.O. Box 3407
Mankato, MN 56002-3407

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Fold & Staple

JM-22-0000312

DELIVERY REPORT

Dealer & Customer Note: This check list must be executed in entirety at time of retail and returned by the dealer to Hiniker Company for warranty validation.

PRE DELIVERY SERVICE & INSPECTION

- ☐ Are the drill units correctly spaced for customer's row spacing?
- ☐ Are all hydraulic fittings, hoses and hydraulic cylinder connections tight?
- ☐ Is all captive air removed from hydraulic cylinders and hydraulic system?
- ☐ Has machine been checked for any loose hardware?
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Phone (____) _____

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- ☐ Show customer TROUBLE SHOOTING Section in Operator's Manual.
- ☐ Emphazise to customer need to read, and understand, Operator's Manual BEFORE STARTING MACHINE!
- ☐ Emphasize to customer the importance of COULTER and SEED placement. Show how to adjust the 4800 Air Drill for seed depth, seed shoe and seed rotary closer.
- ☐ Emphasize to customer the importance of knowing how to calibrate the seed metering equipment.
- ☐ Emphasize to customer the importance of safety in knowing how to hitch up to hitch and unhitch 4836 trailer.
- ☐ Explain to customer the Hiniker Company Warranty coverage.

The above items were reviewed with me at time of delivery.

Customer's Signature _____

Customer's Address _____ State _____ Zip _____

Phone (____) _____

☐ 2nd Copy - Retained by Dealer

JM-22-0000313

DELIVERY REPORT

Dealer & Customer Note: This check list must be executed in entirety at time of retail and returned by the dealer to Hiniker Company for warranty validation.

PRE DELIVERY SERVICE & INSPECTION

- ☐ Are the drill units correctly spaced for customer's row spacing?
- ☐ Are all hydraulic fittings, hoses and hydraulic cylinder connections tight?
- ☐ Is all captive air removed from hydraulic cylinders and hydraulic system?
- ☐ Has machine been checked for any loose hardware?
- ☐ Are all decals and S.M.V. sign clean and undamaged?

Dealer Name: _____

Dealer Address: _____ State _____ Zip _____

Phone (____) _____

Pre Delivery By: _____

DELIVERY TO CUSTOMER

- ☐ Show and explain each CAUTION, WARNING and DANGER machine decal.
- ☐ Insure customer understands safety hazards related to each decal.
- ☐ Explain to customer NOTICE and IMPORTANT machine instructions.
- ☐ Show customer frequent safety related copy throughout Operator's Manuals.
- ☐ Lead customer through full lubrication requirements.
- ☐ Show customer TROUBLE SHOOTING Section in Operator's Manual.
- ☐ Emphazise to customer need to read, and understand, Operator's Manual BEFORE STARTING MACHINE!
- ☐ Emphasize to customer the importance of COULTER and SEED placement. Show how to adjust the 4800 Air Drill for seed depth, seed shoe and seed rotary closer.
- ☐ Emphasize to customer the importance of knowing how to calibrate the seed metering equipment.
- ☐ Emphasize to customer the importance of safety in knowing how to hitch up to hitch and unhitch 4836 trailer.
- ☐ Explain to customer the Hiniker Company Warranty coverage.

The above items were reviewed with me at time of delivery.

Customer's Signature _____

Customer's Address _____ State _____ Zip _____

Phone (____) _____

☐ 3rd Copy - Retain by Customer

JM-22-0000314

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80305341 1/99 FN #1023,#E1060

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JM-22-0000315

INTRODUCTION

Congratulations on your purchase of a new Hiniker 4836 Air Seeder Cart and 4800 Air Drill. Your selection is an indication of your awareness of the intense research, engineering, design and quality control that has produced your durable and dependable air drill from Hiniker.

This manual is provided as set-up and assembly instructions, and as an aid to the operator in explaining settings and adjustments for all soil, residue and functional applications of the Hiniker Air Drill and Air Seeder Cart. Also, its operational care and maintenance requirements. Careful application of the recommended procedures contained in this manual will assure you of many years of dependable, efficient operation.

Your Hiniker Air Drill has been designed to accept additional attachments to broaden its scope of operation and make your job easier under unusual or adverse field conditions. These attachments are described in the attachment section of this manual and are available through your local Hiniker Dealer.

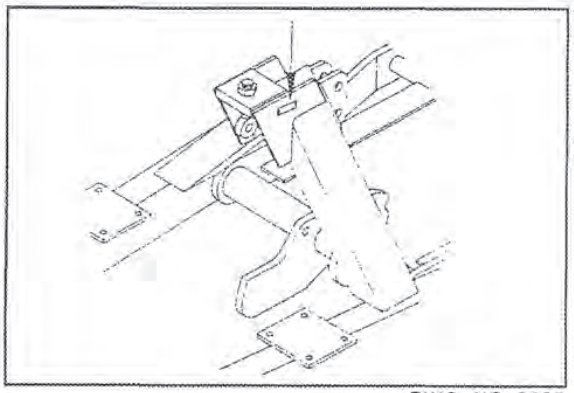
"Right hand" and "left hand" sides of your air drill are determined by facing the direction that the 4836 Air Seeder Cart and 4800 Air Drill travels while in use.

Always obtain original Hiniker service parts because substitute parts could adversely affect equipment performance and warranty.

A triplicate (3 copies) delivery report is to be filled out by your Hiniker Dealer when you accept this equipment. One copy is to be given to you. Do not accept this equipment until you are satisfied all items thereon have been checked, and you understand them.

Check that your dealer has forwarded the HINIKER delivery report copy, along with the machine serial number, because it helps maintain maximum service and warranty benefits. This does not put you on any mailing list and information is not available to others.

The serial number tag is located on the left side of the trailer, near the eyebolt holding the 5 x 8 cylinder.



DWG. NO. 3627

Record the following information for later reference when obtaining service parts:

Purchase Date _____

Purchaser's Name _____

Dealer's Name _____

Machine Serial No. _____

SAFETY

TAKE NOTE! THIS SAFETY ALERT SYMBOL FOUND THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY AND THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.



THIS SYMBOL MEANS

- ATTENTION
- BECOME ALERT!
- YOUR SAFETY IS INVOLVED!

SIGNAL WORDS:

Note the use of the signal words **DANGER**, **WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each has been selected using the following guidelines:

DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations typically for machine components which, for functional purposes, cannot be guarded.

WARNING: YOUR SAFETY AND THE SAFETY OF THOSE AROUND YOU DEPEND UPON YOUR USING CARE AND GOOD JUDGEMENT IN THE OPERATION OF THIS EQUIPMENT. KNOW THE POSITIONS AND FUNCTIONS OF ALL CONTROLS BEFORE ATTEMPTING TO OPERATE.

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION: Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

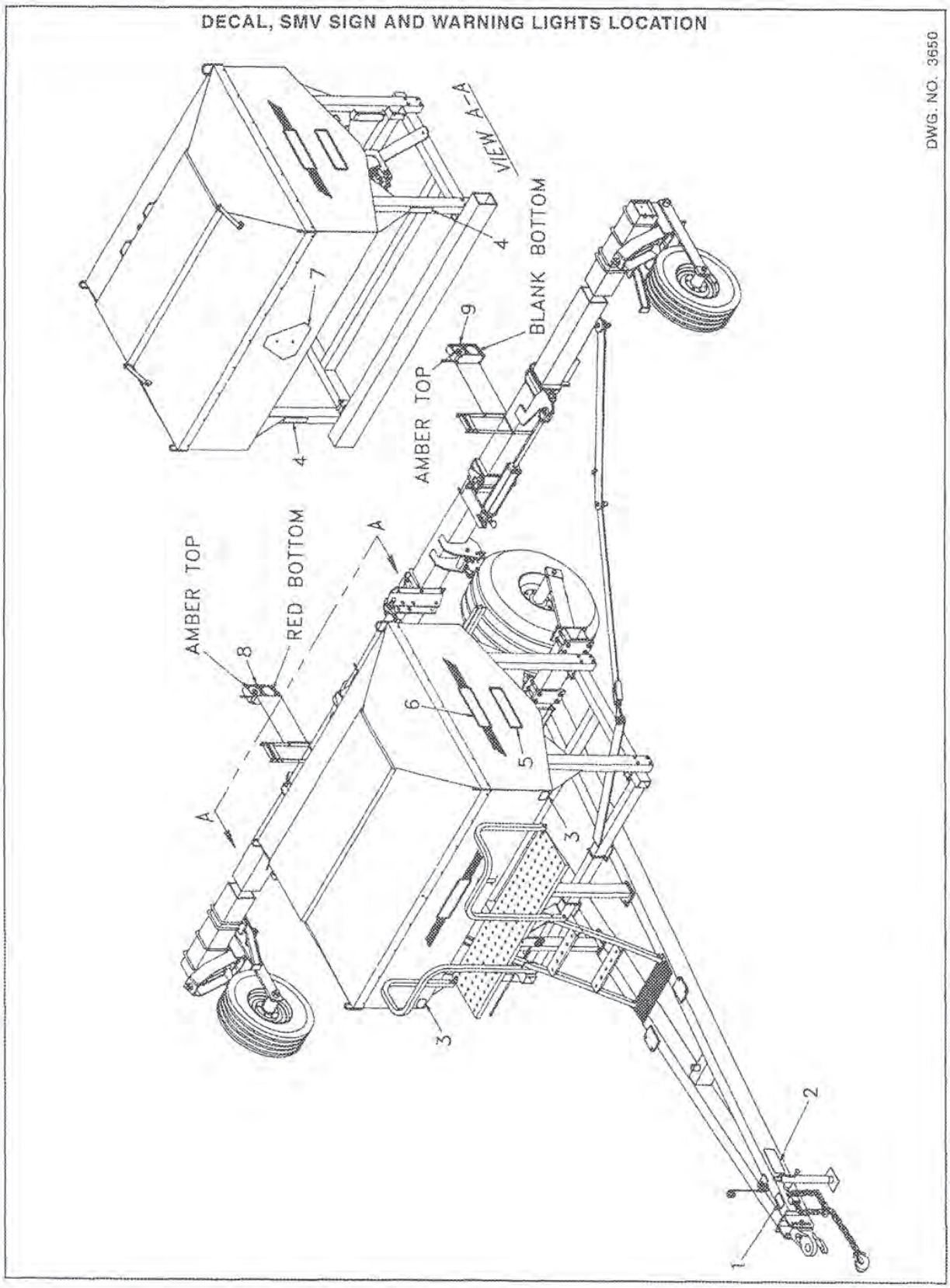
All equipment has limitations. Understand the speed, braking, steering, stability, and load characteristics of the machine before starting to operate. Read your OPERATOR'S MANUAL!

The following are safety requirements that apply to your 4800 Air Drill. Review them often as safety reminders.

- Check all controls and operating functions of the machine in a safe area before starting to work.
- Keep off, keep others off, and insure every one is clear before starting, actuating hydraulics for lifting and lowering, and fold toolbar.
- When service demands working on, under, or around, tillage implement, proper precautions should be taken to stabilize or secure implement. (Lowering stands, blocking of implement, etc.)
- When transporting the machine, ensure all warning devices, such as SMV sign, flashing warning lights, and reflective devices are in place, clean, and clearly visible.
- Watch where you are going. Note all hazards and obstructions such as ditches, overhead electrical wires, narrow gates, etc. when transporting and/or operating the machine. Refer to page 6 of this manual for transport width specifications.

  Never ride or permit others to ride on tractor drawbar or on machine; nor allow anyone other than yourself on the tractor while in operation.
- Never operate 4800 Air Drill without having safety chain properly in place between tractor and trailer.
- Reduce tractor speed when transporting over uneven or rough terrain.
- When transporting down steep hills or slopes, shift tractor into lower gear.
- Never fold toolbar wings forward when others are standing on the trailer or catwalk.
- Escaping hydraulic fluid under pressure can have sufficient force to penetrate the skin causing serious personal injury. Before connecting lines, be sure to relieve all pressures in the system by moving hydraulic control levers in both directions before attaching couplers.
- Before disconnecting lines, be sure to relieve all pressures to the system.
- Be sure all connections are tight and that lines, pipes, and hoses are not damaged or worn.
- A very small leak from a hydraulic line, pipe, hose, or fitting can be almost invisible. Use a piece of cardboard or wood when checking for suspected leaks rather than your hands.
- If injury is received from escaping fluid, see a doctor at once, as serious reaction or infection can result if proper medical treatment is not received immediately.
- Never operate wing fold cylinders on folding toolbar models without (4) restrictor fittings, one at each end of lift cylinder.

4 Decal Location



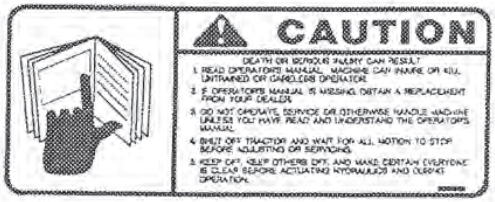
JM-22-0000319

1. SAFETY DECAL



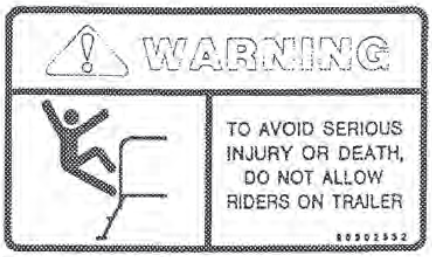
Decal (1) 85501787, on top of left hand tongue tubing near front end.

2.



Decal (1) 85501783, on side of left hand tongue tubing near front jack mount.

3.



Decal (2) 80302332, on the low front of tank, one on each end.

4.



Decal (2) 850-001-305 Red Reflective Tapes, on the outer rear tank leg, one on each end.

5. MODEL DECAL



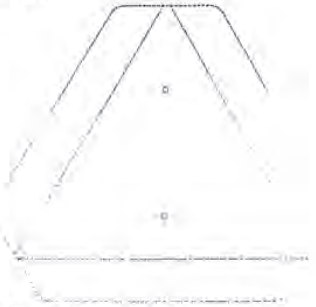
Decal (2) 80305266, on the side of tank, one on each end.

6.



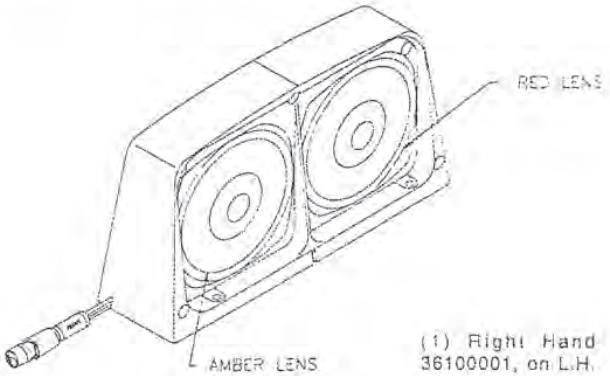
Decal (3) 71505168 on the rear, on each end of tank.

7. SMV SIGN



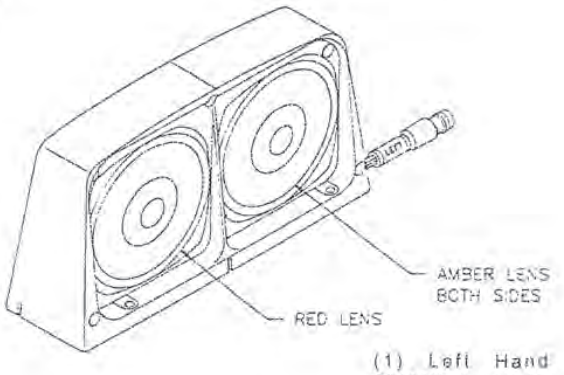
(1) Sign 850-001-354, on rear of tank.

8. WARNING LIGHTS



(1) Right Hand 36100001, on L.H. inner toolbar

9.



(1) Left Hand 36100000, on L.H. inner toolbar

REMEMBER: If Safety Decals, SMV Sign or Warning Lights have been damaged, removed, become illegible or parts replaced without decals, new decals or lights must be installed. New decals, SMV Sign or Warning Lights are available from your authorized dealer or Hiniker Company.

SPECIFICATIONS

STANDARD EQUIPMENT

4836 TANK/TRAILER and 4800 AIR DRILL

— 7 x 7 Inch Single Center Frame Toolbar.

—7 x 7 Inch Toolbar Wings with End Plates and Block Removing Rod.

—Safety Lights and Wiring.

—Hitch Mounting Brackets.

—One Pair Of Toolbar Wing Rests.

—Infinite Speed Roll Meter with Soybean Rates From 30 To 175 Lbs. Per Acre.

—Two Wheel Trailer Cart, with Three Point Hitch.

—Two 19L x 16.1 Tires/Rims On Trailer Cart.

—Wheel Spacing At 74 Inch Center.

—Hopper Capacity 130 Bushels.

—13 GPM Hydraulic Motor On Air Delivery Blower.

—Hydraulic Hoses To Tractor From Hydraulic Motor.

—Air Pressure Gauge On Air Delivery Manifold.

—Safety Chain

TILLAGE UNIT

—16 Inch Disc Opener with 3 X 16 Rubber Gauge Wheel and Mounted Individual Row Unit.

—Parallel Linkage with 8" Total Travel.

—Seed Tube with Cast Chrome Seed Opening Boot and Seed Shoe Block.

—12 Inch Angled Metal Rotary Seed Closing Disc Mounted On Spring Loaded Arm That Adjusts For Angle and Down Pressure.

—Weight Transfer Systems with Variable Adjustment Up To 500 Lbs/Row.

TRACTOR REQUIRED EQUIPMENT

—Closed Center Hydraulic System Providing At Least 13 GPM.

—12 Volt D.C. Electrical System.

MODEL NO.	NO. OF ROWS	ROW SPACING	TRANSPORT WIDTH W/O MARKERS	TRANSPORT HEIGHT W/O MARKERS	APPROX. WEIGHT LBS.	OPTIONAL CONCRETE BLOCK WEIGHT LBS.
4831	24	15	15'10"	8'11"	11,025	495
4832	36	10	15'10"	8'11"	12,705	495
4833	32	15	15'10"	8'11"	12,605	855

JM-22-0000321

LUBRICATION

4800 TOOLBAR

CAUTION: Never clean, lubricate, inspect, repair, or adjust your machine, nor allow anyone else to, while it is in operation.

Lubrication of moving parts and wear surfaces is essential to the extended service life of those parts. Inspect your machine frequently to ensure that all parts are working smoothly in addition to inspection and lubrication at required intervals as indicated.

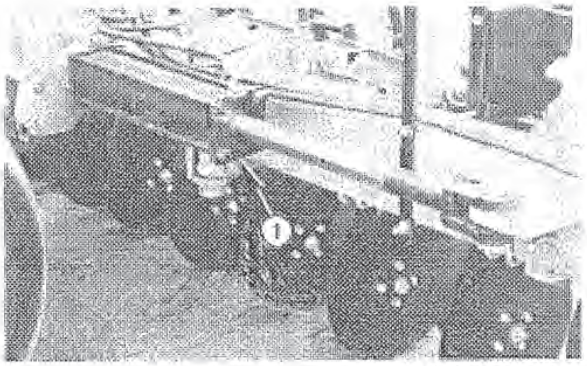


PHOTO NO. 3935

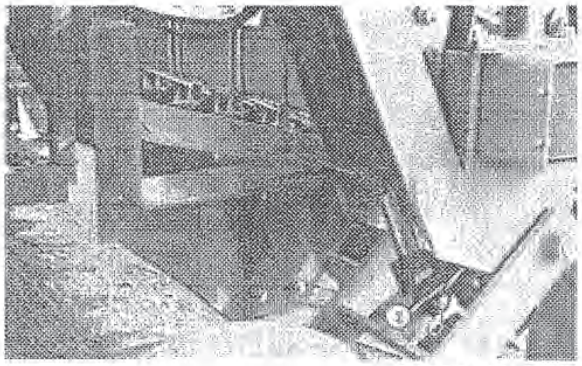


PHOTO NO. 3936

The use of sealed ball bearings and oil impregnated bushings throughout the drill limits the grease fittings requiring periodic lubrication. Following are the fitting locations and hourly intervals requiring a high quality SAE multi-purpose grease.

200 HOURS

—FOLDING TOOLBAR HINGE - No restriction of grease volume in single hinge fitting.

—OUTER TOOLBAR WING LIFT - No restriction of grease volume in single hinge fitting.

Variable speed box (arrow 1). The ZERO-MAX drive runs in oil and is filled at the factory with **Chevron Delo 100 Motor Oil SAE 40.** If ZERO=MAX No. 400 lubricant (Chevron Delo 100) is not available from your ZERO-MAX distrubutor or service station, use **Mobil -Delvac 1140.** In an emergency, use a good grade of SAE 40 detergent motor oil.

The proper quantity of lubricant when refilling the Zero-Max drive is 95 ounces (2.812 liters).

Lubricate all roller chains periodically with a high quality chain lubricant (arrow 2, five chain assemblies.

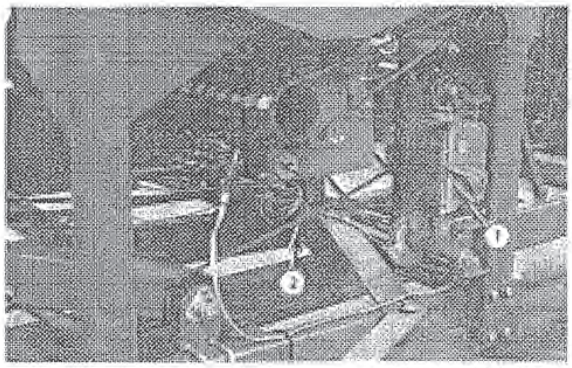


PHOTO NO. 3937

PREPARING FOR FIELD USE

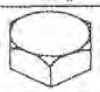
PREPARING 4836 TANK/TRAILER AND 4800 AIR DRILL

Prior to the operation of your new drill or one which has been stored, inspect all hardware and verify proper torque on all bolts and nuts in accordance with the recommended torque specifications listed below.

STANDARD MARKINGS AND TORQUE SPECIFICATIONS

Manufacturer marks may vary. These are all SAE Grade 5 (3-line).



SAE Grade Number	1 or 2		5		8	
Capscrew Head Markings						
Capscrew Body Size (Inches) - (Thread)	Torque FT-LB	(kgm)	Torque FT-LB	(kgm)	Torque FT-LB	(kgm)
1/4 - 20	5	(0.6815)	8	(1.1064)	12	(1.6596)
- 28	6	(0.2898)	10	(1.3830)	14	(1.9362)
5/16 - 18	11	(1.5213)	17	(2.3511)	24	(3.3192)
- 24	13	(1.7979)	19	(2.6277)	27	(3.7341)
3/8 - 16	18	(2.4894)	31	(4.2873)	44	(6.0852)
- 24	20	(2.7660)	35	(4.8405)	49	(6.7767)
7/16 - 14	28	(3.8132)	49	(6.7767)	70	(9.6810)
- 20	30	(4.1490)	55	(7.6065)	78	(10.7874)
1/2 - 13	39	(5.3937)	75	(10.3725)	105	(14.5215)
- 20	41	(5.6703)	85	(11.7555)	120	(16.5960)
9/16 - 12	51	(7.0533)	110	(15.2130)	155	(21.4365)
- 18	55	(7.6065)	120	(16.5960)	170	(23.5110)
5/8 - 11	83	(11.4789)	150	(20.7450)	210	(29.0430)
- 18	95	(13.1385)	170	(23.5110)	240	(33.1920)
3/4 - 10	105	(14.5215)	270	(37.3410)	375	(51.8625)
- 16	115	(15.9045)	295	(40.7985)	420	(58.0860)
7/8 - 9	160	(22.1280)	395	(54.6285)	605	(83.6715)
- 14	175	(24.2025)	435	(60.1605)	675	(93.3525)
1 - 8	235	(32.5005)	590	(81.5970)	910	(125.8530)
- 14	250	(34.5750)	660	(91.2780)	990	(136.9170)

DWG. NO. 1935

CAUTION: Loose bolts can cause elongation of holes and part failures resulting in dangerous operating conditions and equipment breakdown. Check all bolts and nuts periodically during equipment operation and keep them tightened to torques specified. When bolt replacement becomes necessary, replace worn bolt with equal SAE grade bolt number.

TRACTOR REQUIREMENTS

Tractor horsepower requirements are moderate, but soil types, soil conditions, and field terrain such as rolling or hilly conditions may affect the amount of horsepower required. The approximate horsepower required for the following drills are:

MINIMUM TRACTOR REQUIREMENTS	
4831	180 HP
4832	180 HP
4833	200 HP

If the recommended tractor size is being used and the front of the tractor seems light, or difficulty is encountered when turning, weight will have to be added to the front of the tractor. The importance of this weight will probably be more noticeable when planting in rolling or hilly areas,.

Usual methods of adding weight to the front of the tractor will include supplemental tractor weight, accessory rock boxes, and front or saddle tanks which may be used for liquid fertilizer or herbicide.

In hilly areas this is especially important because when the front of the tractor raises, the rear of the drill penetrates deeper resulting in seed being placed too deep to emerge.

NOTE: For complete tractor operating instructions refer to your tractor operators manual.

CAUTION: Front end ballast may not always maintain the required stability if the tractor is driven too fast over rough ground with the planter in raised position. Be safe and drive slowly under these conditions.

TRACTOR AND HITCH PREPARATION

For complete tractor operating instructions and use of 3-point hitch implements, refer to your tractor operator's manual.

Place tractor on level surface and check tire inflation to ensure equal tire pressure. Lower draft arms to their lowest position and adjust lift links so that both draft arms are the same distance off the ground as measured from the draft arm sockets.

Reference tractor operator's manual for proper adjustment of draft arms and center link. If a quick hitch coupler is to be used, install it to the 3-point hitch at this time in accordance with the tractor operator's manual.

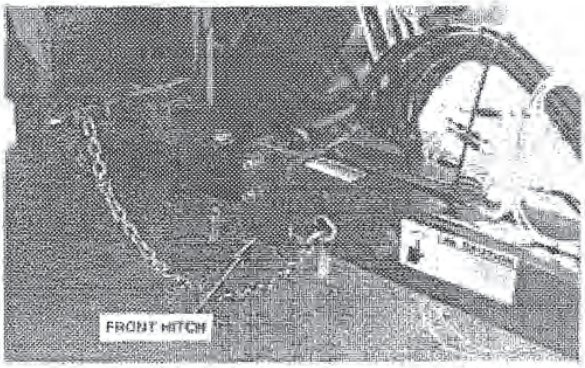


PHOTO NO. 3938

Attach 4836 trailer/tank to tractor, and adjust front hitch to have level frame. With tractor attached to trailer, place two (2 x 4's) down on the ground in front of each of the trailer tires and drive forward, raising trailer 1 1/2 inches.

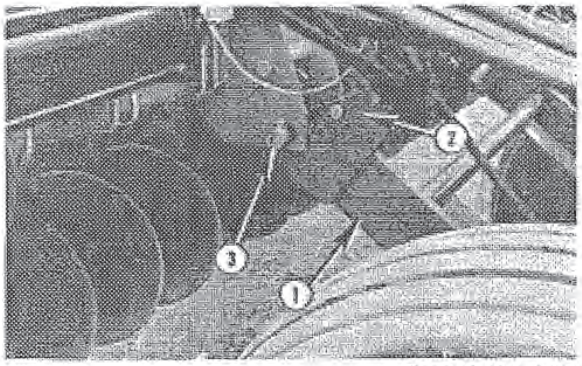


PHOTO NO. 3939

Attach trailer lower lift arms (arrow 1) to lower hitch on 4800 air drill toolbars. *Note: Position of lower hitch latch (arrow 2). This will allow hitch pin (arrow 3) to float up and down in lower lift arm hook.*

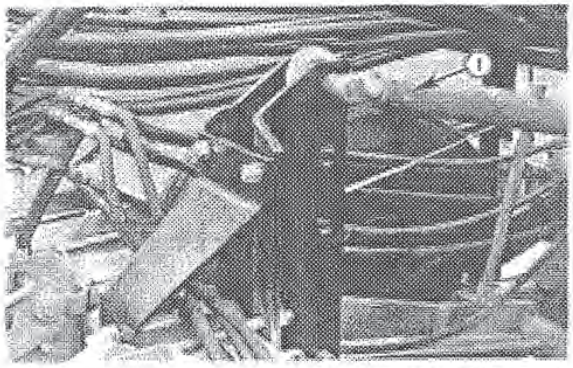


PHOTO NO. 3940

Install upper hitch arm (arrow 1) as shown in upper hole on toolbar hitch. Adjust length to have 7 x 7 toolbar running level in the planting position, with bottom of toolbar approximately 21 inches off the ground.

TIRE INFLATION

While it is always important to have tires inflated to the correct pressure as specified in the tractor operator's manual, the additional weight of the 4836 Seeder Attachment makes this check essential to avoid premature tire failure.

⚠ *CAUTION: After attaching 4800 Air Drill to tractor, check front end stability. Tractor front end stability is necessary for safe and efficient operation. Therefore, it is important that the proper amount of weight be installed on the front of the tractor, as recommended in your tractors operator's manual.*

TOWING

When towing 4836 Seeder on highways:

—Use safety towing chain between the trail hitch and the towing tractor. (Safety towing chains are marketed by HINIKER.)

—Use a tractor of sufficient size and weight, required for field operation.

—Do not tow faster than 25 MPH (40 KPH).

—Check local regulation on towing width and warning lights.

OPERATION PROCEDURES AND ADJUSTMENTS

ADJUSTMENT PHOTO

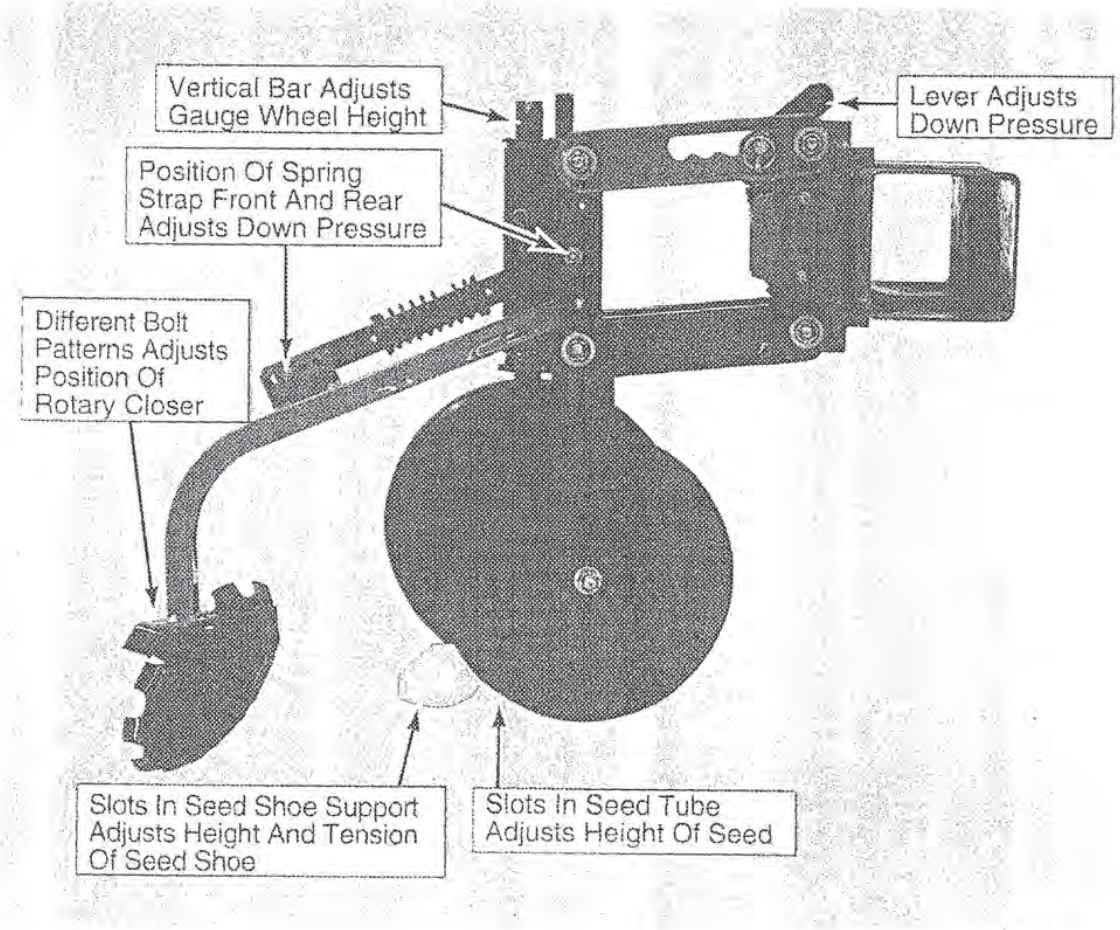


PHOTO. NO. 3603

NOTE: REFERENCE ADJUSTMENT PHOTO FOR ALL OPERATION PROCEDURES AND ADJUSTMENTS.

JM-22-0000325

DOWN PRESSURE

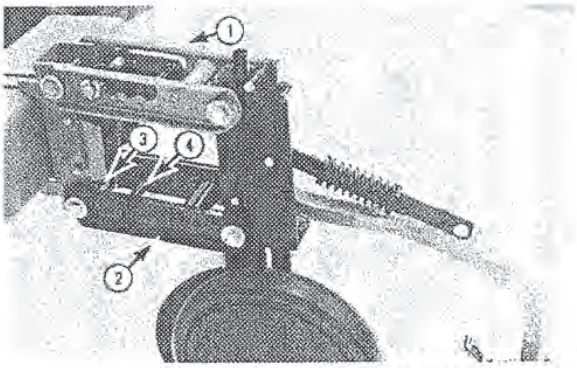


PHOTO NO. 3604

Always operate with parallel links (Arrow 1 & 2) level or near level. Have tractor carry toolbar 20 inches off ground, and adjust toolbar gauge wheel to that same dimension.

Down pressure requirements will vary depending on no till or tilled condition, soil type condition and soil moisture. Two spring anchors (Arrow 3 & 4) are provided for these different conditions.

NO-TILL CONDITION
HEAVY DOWN PRESSURE

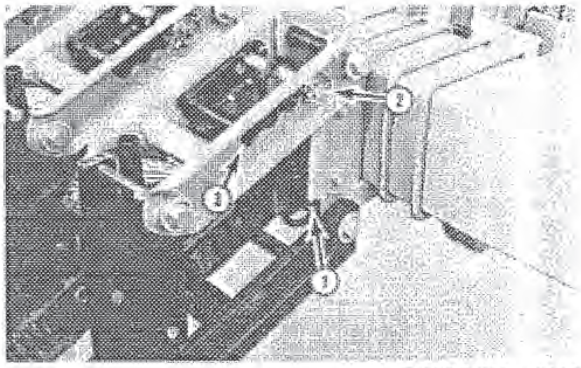


PHOTO NO. 3605

Install down pressure spring with large 1 inch hook opening at bottom, over front 7/8 diameter (Arrow 1). Upper 3/4 pin (Arrow 2) will install best in front hole with parallel link in down position, as shown in photo. With parallel links level, the down pressure will vary from 165 lbs at front (Arrow 2) to 500 lbs at rear (Arrow 3).

TILLED CONDITION
LIGHT DOWN PRESSURE

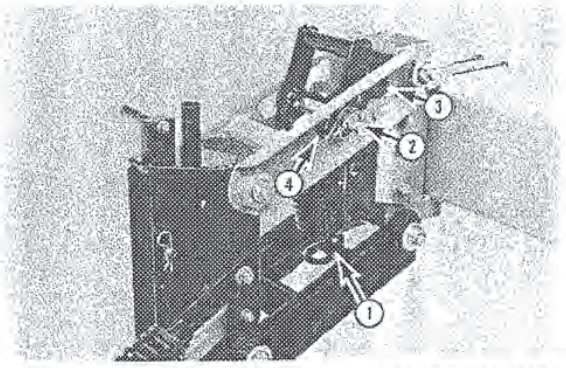


PHOTO NO. 3606

Install down pressure spring with 1 inch hook opening at bottom over rear 7/8 diameter (Arrow 1). Upper 3/4 pin (Arrow 2) will install best in the third hole with parallel link in down position as shown in photo. With parallel links level, the down pressure will vary from 90 lbs at front (arrow 3) to 220 lbs at rear (Arrow 4).

GAUGE WHEEL

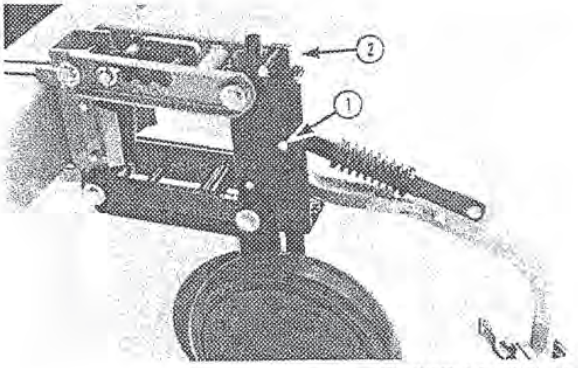


PHOTO NO. 3604A

Adjust gauge wheel by removing lock pin (Arrow 1), then raise or lower vertical flat bar (Arrow 2) and repin at the desired seed depth wanted.

ROTARY CLOSER DOWN PRESSURE

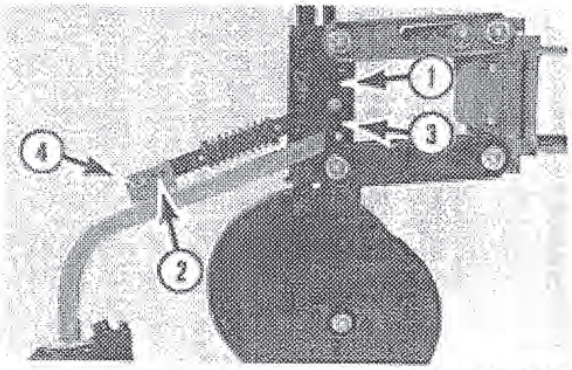


PHOTO NO. 3607

To increase down pressure on rotary closer, move front anchor up on mast weld (Arrow 1) and move rear anchor ahead on support arm (Arrow 2). See adjusting tip below.

To decrease down pressure on rotary closer, move front anchor down on the mast weld (Arrow 3) and move rear anchor rearward on support arm (Arrow 4).

ADJUSTING ASSEMBLY TIP

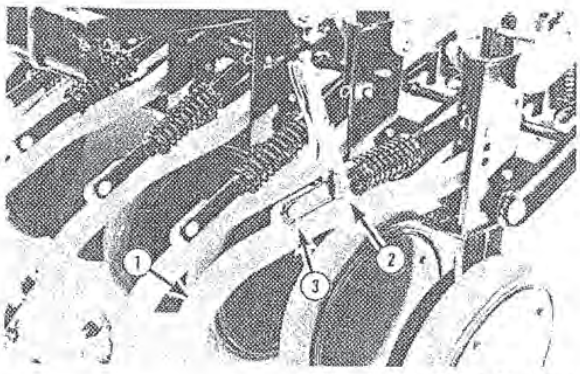


PHOTO NO. 3608

When increasing down pressure and moving rear anchor ahead, lift up support arm (Arrow 1) and use vise grip to secure the end of front strap (Arrow 2). Move rear anchor (Arrow 3) ahead.

ROTARY CLOSER ANGLE ADJUSTMENT

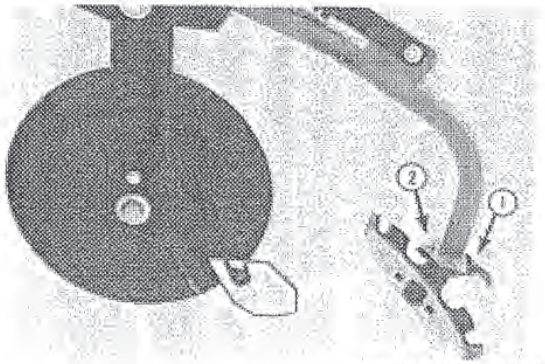


PHOTO NO. 3609

The rotary closer support (Arrow 1) has three angle settings, to increase or decrease the amount of loose soil thrown. Different soil types, the amount of residue, no-till or tilled condition and ground speed will vary the rotary closure angle. Always install the three 5/16 hex cap screws coming up from the bottom. Hold rotary closer support in one hand and turn 5/16 whiz nut (Arrow 2) with the other.

NOTE: The rotary closer only moves loose soil.

SEED TUBE ADJUSTMENT

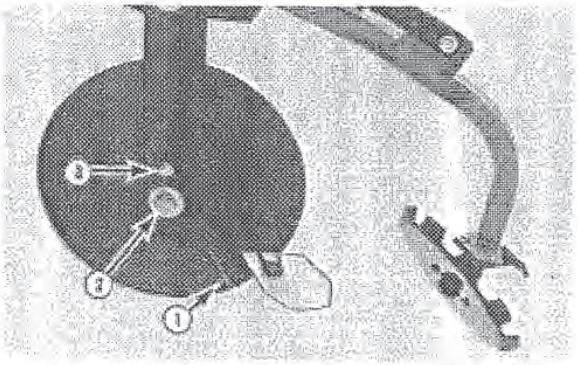


PHOTO NO. 3610

To raise or lower seed tube boot outlet (Arrow 1) loosen 3/4 hex cap screw (Arrow 2) and 3/8 hex cap screw (Arrow 3). Move to desired height and retighten both 3/4 hex cap screw and 3/8 hex cap screw to hold seed tube boot in place.

When properly adjusted, bottom edge of seed boot should be 1/4" or less above bottom edge of disc.

NOTE: As disc blade wears in size and becomes smaller, always recheck position of seed tube boot to coulter blade. Do not allow it to run too deep. In some cases the disc blade must be replaced, when it is smaller then 14 1/2 inches in diameter.

SEED SHOE ADJUSTMENT

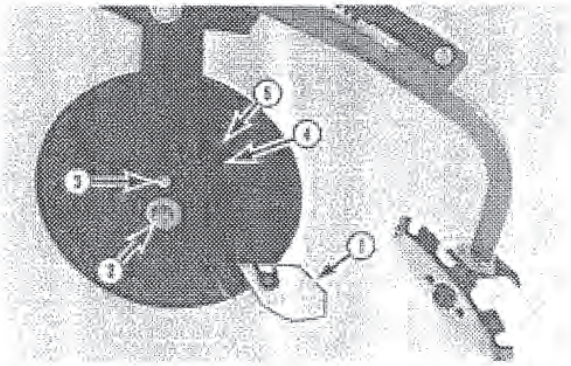


PHOTO NO. 3610A

The seed shoe (Arrow 1) has two adjustments, height and tension. To change height loosen 3/4 hex cap screw (Arrow 2) and 3/8 hex cap screw (Arrow 3). Move to desired height and retighten cap screws. To change seed shoe tension, loosen 5/16 hex cap screw (Arrow 4). Pull adjusting bar (Arrow 5) rearward to increase tension and push forward to decrease tension.

NOTE: In wetter soils the seed shoe should be in light tension setting.

TRANSPORTING

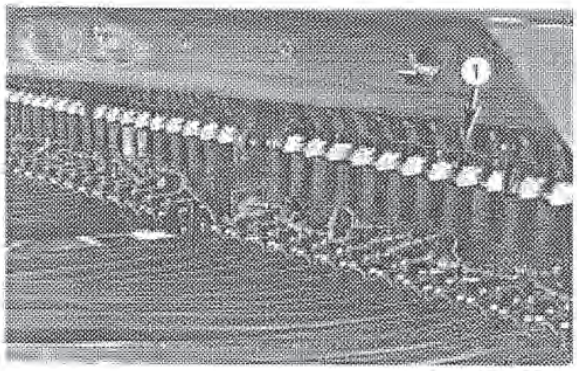


PHOTO NO. 3941

When traveling long distances with hopper full of seed, all slide straps (arrow 1) may be lowered into closed position.

When folding the toolbar in the transport position, the outer toolbar wings sit on rests.

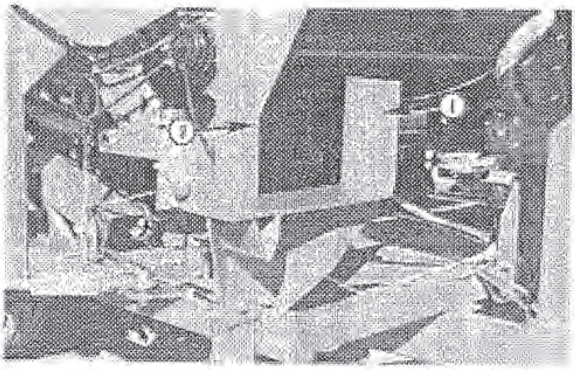


PHOTO NO. 3942

The 30 ft. toolbar wing rests (arrow 1) are bolted to the front posts of the 130 Bu. tank (arrow 2).

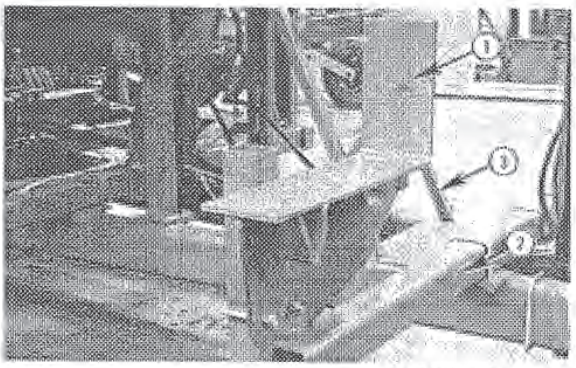


PHOTO NO. 3943

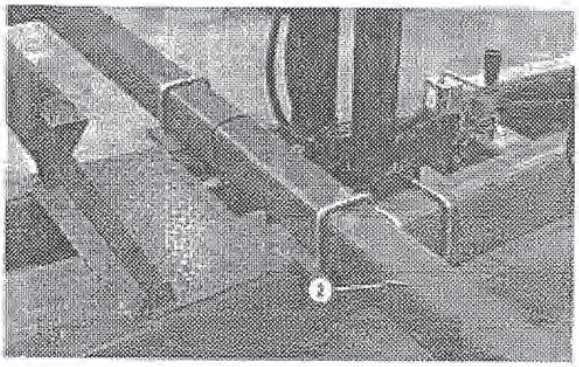


PHOTO NO. 3944

The 40 ft. toolbar wing rests (arrow 1) are bolted onto a cross tube (arrow 2) placed in front of the catwalk (arrow 3). The cross tube is bolted to the trailer.

JM-22-0000329

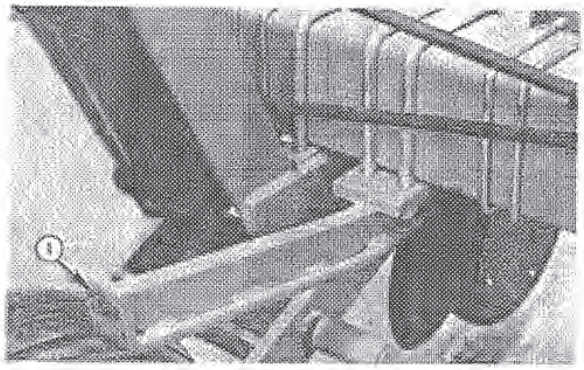


PHOTO NO. 3945

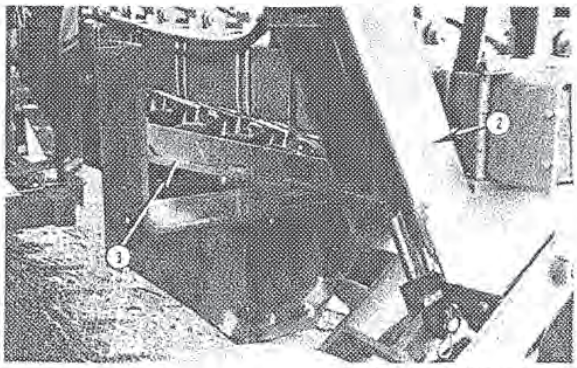


PHOTO NO. 3936A

A guide (arrow 1) is bolted to both the left and right outer toolbar wings. The guide is used to determine the distance the outer wings must fold before the wheel lifts (arrow 2) can be raised.

NOTE: Both the left and right outer wing guides must be touching the vertical end of the wing rest (arrow 3) before raising the wheel lift. Check both sides are up to back stop before raising wheel lift arms and locking for transport.

IMPORTANT: When toolbar lowers onto toolbar rest, it will move rearward 2 to 3 inches. Failure to take precaution may result in bodily injury or equipment damage.

PLASTIC SHIELD

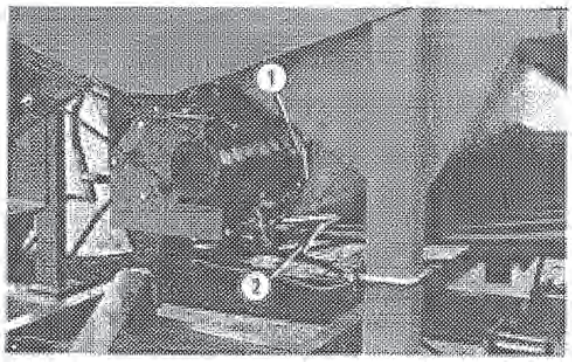


PHOTO NO 3947

To protect the seed metering device from debris when in the field and transporting, the plastic shield (arrow 1) can be rolled down using the crank (arrow 2) on the left side of the tank.

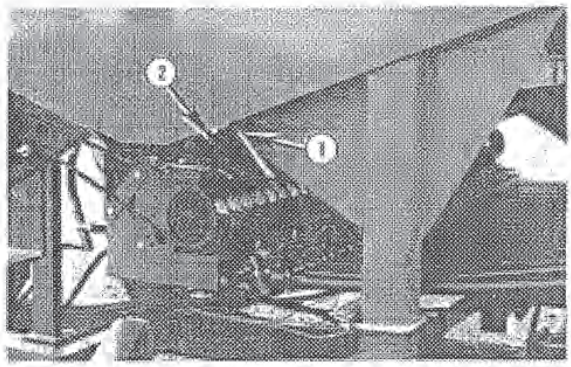


PHOTO NO. 3948

If access to the seed metering device is needed, the shield can be rolled up. The shield is locked into the rolled up position by the crank (arrow 1) snapping into the flat spring (arrow 2). The flat spring is found above the crank on the left side of the tank.

The crank can be moved to the right side of the tank if needed. Remove the 1/4" bolt, hex nut, and lockwasher holding the crank into the roll up pipe. Remove the crank and move it to the right side of tank and install in right side of roll up pipe as previously done on the left side. Remove the flat spring by removing the 1/4" self tapping screw. Transfer the flat spring to the right side of the tank using the hole provided on the tank and the 1/4" self tapping screw.

CALIBRATION

The following variables affect the rates as shown on the rate charts:

1. Quality of Seed - Two bags of seed that weigh the same may have different quantities of seed because of moisture content trash, unfilled kernels, or seed size.

2. Wheel Slippage - It can vary depending on drive tire size, seed bed condition, and soil type. Speed also affects wheel slippage.

3. Drive Tire - Size, type, and air pressure affect seeding rates. Use the recommended tire size and proper air pressure.

4. Operator Judgement - Land may contain more or less area than assumed. Overlapping rows or leaving too wide a space between rows will affect overall rate.

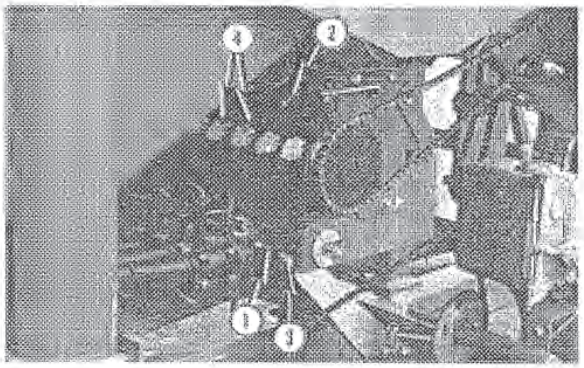


PHOTO. NO. 3949

Remove first mixing chamber (arrow 1). Raise first slide strap (arrow 2), and hang bucket on self tapping screws (arrow 3). Shut off remaining outlets with slide straps (arrow 4).

NOTE: Weight your bucket before starting to calibrate.

See seed chart page 19 and select the amount of seed (pounds per acre). *NOTE: The amounts shown are approximate per acre.*

Seed calibrating can be done by an in-shop test using calibrating sprocket provided on hopper. Follow step 1 and step 2.

STEP 1 (IN SHOP)

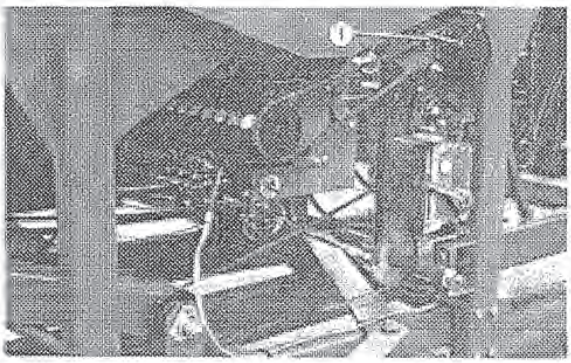


PHOTO. NO. 3937C

Disengage both electric clutches (arrow 1) on the left and right side of the tank.

STEP 2 (IN SHOP)

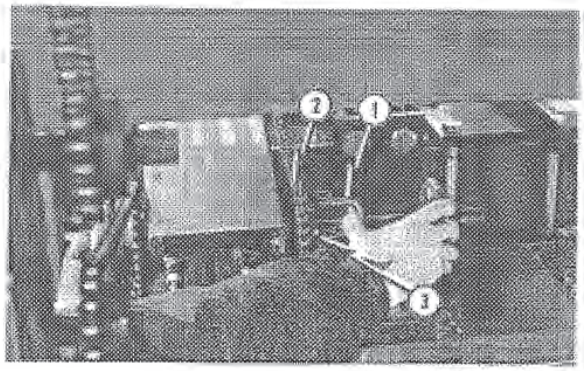


PHOTO. NO. 3952

Disengage handle (arrow 1) from the 32 teeth sprocket (arrow 2) by pulling handle and placing end of handle onto the sprocket hub (arrow 3) of the 32 teeth sprocket.

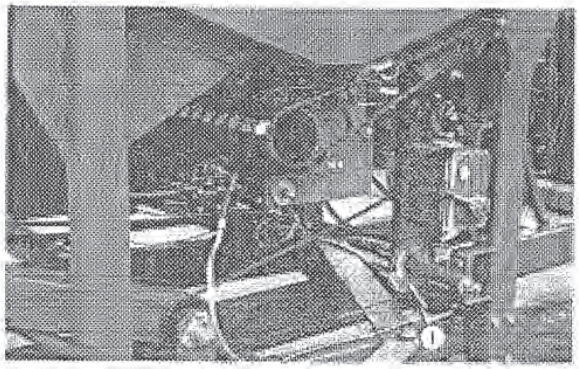


PHOTO NO. 3937A

By engaging the electric clutches and the handle from the 32 teeth sprocket, the calibration sprocket (arrow 1) can turn freely.

STEP 3 (IN SHOP)

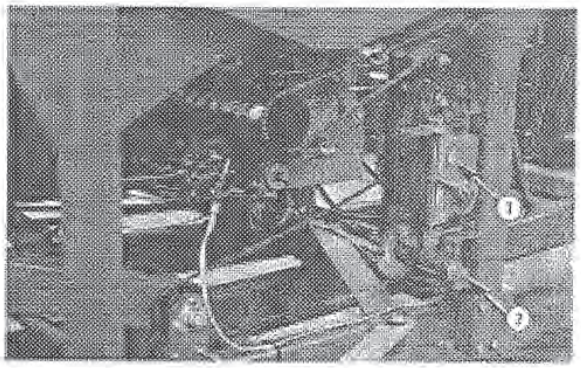


PHOTO NO. 3937B

Select the amount of seed, pounds per acre, from seed chart and the number to be used on variable speed box (arrow 1). With bucket in place, turn 1 1/8" hex (arrow 2) counter clockwise. (See chart below for number of revoltions), then get a total weight of bucket/soybeans. Now subtract weight of bucket. This amount x 300 (1/300 acre) = total pounds per acre.

Example: #3.2 on variable speed box, weight of soybeans in bucket (15 inch row) = .4 lbs.

.4 x 300 = 120 lb per acre.

REVOLUTIONS OF CALIBRATION SPROCKET		
ROW SPACING	NUMBER OF REV.	DISTANCE TRAVELED
15 INCH	32 1/2	116 FT.
10 INCH	48 1/2	174 FT.

REFERENCE INFORMATION

1 acre= 43,560 Sq. Ft. 43,560 divided by 300 = 145 Sq. Ft..
(15 Inch Row) One Outlet = 15" = 1.25'.
145 Sq.Ft. divided by 1.25' = 116 Ft.
(10 Inch Row) One Outlet = 10" = .8333'.
145 Sq.Ft. divided by .8333 = 174 Ft.

REMOVING AND CHANGING SEED METERING WHEELS

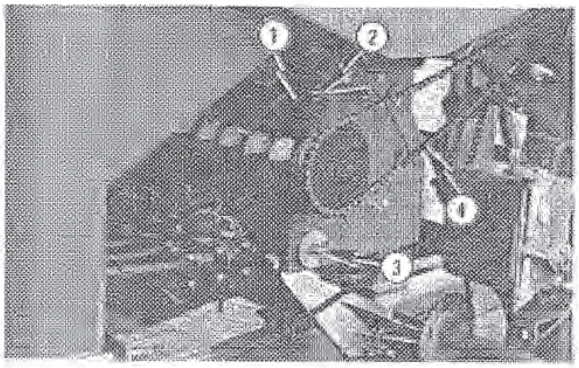


PHOTO. NO. 3949B

The seed chart on page 19 indicates different seed metering wheels for various types of seed. These wheels are color coded for easy identification.

To remove and change seed metering wheels, first lower the seed slide gates (arrow 1) to a closed position. Remove the wing nuts (arrow 2 and 3) and their bolts. Next remove the sprocket roller chain (arrow 4). Now the entire metering wheel assembly can be removed and placed on a bench.

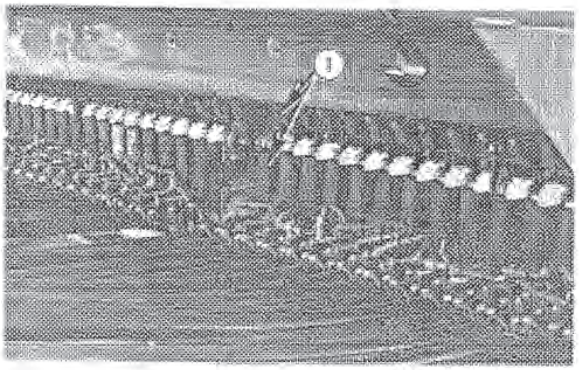


PHOTO NO. 3941A

Remove the metering shaft bearing bolts (arrow 1). The metering wheels and shaft assembly will now lift out of the seed venturis. To remove the seed metering wheels, slide the bearing and metering wheels off the shaft.

Reverse this procedure for the installation of the new metering wheels.

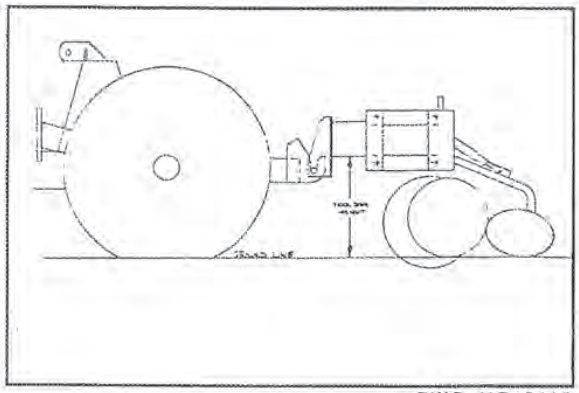
SEED CHARTS AND CALIBRATION

The following population charts are approximate for each gear box setting. Soybean rates are based on 2650 seeds per pound. There are many variables which will affect the actual seeding rate. These include seed size and weight. Always calibrate 4800 seeder before starting to seed or when changing varieties. As population rates increase, planting speed may have to be reduced so capacity of the seed hose is not exceeded. Be sure to factor in the germination percent of your seed when determining final seed population.

Calibration of the 4800 Seeder is both quick and simple. After selecting the desired rate on the appropriate chart, calibrate to check the actual rate. If the actual rate is high or low, reset and calibrate again.

GEARBOX SETTING	15 Inch Rows					10 Inch Rows				
	Soybeans	Wheat	Wheat	Oats	Oats	Soybeans	Wheat	Wheat	Oats	Oats
	White Meter Wheel	Red Meter Wheel	Black Meter Wheel	Black Meter Wheel	Red Meter Wheel	White Meter Wheel	Red Meter Wheel	Black Meter Wheel	Black Meter Wheel	Red Meter Wheel
	lbs/acre					lbs/acre				
1.0	29	29	18	7	17	43	43	27	10	25
1.2	35	35	22	8	20	52	52	33	12	30
1.4	43	43	27	10	24	64	64	40	15	36
1.6	50	50	32	12	29	75	75	48	18	43
1.8	58	58	37	13	32	87	87	55	19	48
2.0	66	66	42	15	37	99	99	63	22	55
2.2	74	74	47	17	41	111	111	70	25	61
2.4	82	82	52	19	46	123	123	78	28	69
2.6	90	90	57	21	51	135	135	85	31	76
2.8	100	100	63	23	56	150	150	94	34	84
3.0	108	108	68	25	61	162	162	102	37	91
3.2	120	120	76	28	67	180	180	114	42	100
3.4	129	129	82	30	73	193	193	123	45	109
3.6	144	144	91	33	78	216	216	136	49	117
3.8	148	148	94	34	83	222	222	141	51	124
4.0	164	164	104	38	92	246	246	156	57	138
4.2	172	172	109	40	98	258	258	163	60	147
4.4	190	190	120	44	107	285	285	180	66	160
4.6	203	203	128	47	114	304	304	192	70	171
4.8	217	217	137	50	122	325	325	205	75	183
5.0	234	234	148	54	131	351	351	222	81	196

TOOLBAR HEIGHT ADJUSTMENT



DWG. NO. 3416

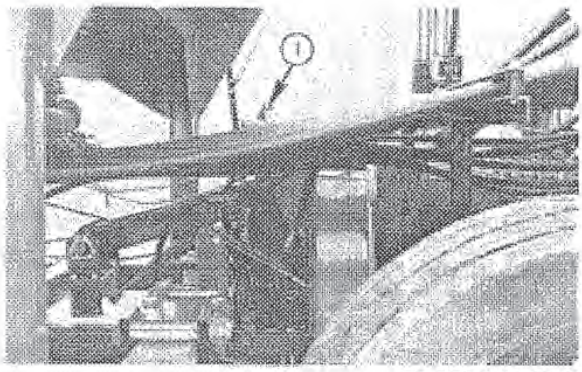


PHOTO NO. 3957

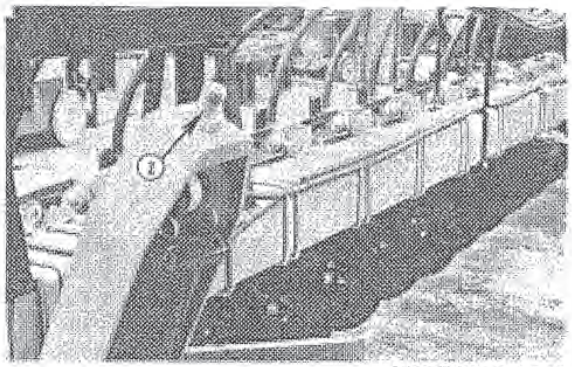


PHOTO NO. 3958

Toolbar height can be adjusted using three eye bolts. The center eye bolt (arrow 1) is attached to the center cylinder found on the trailer. The other two eye bolts (arrow 2) can be found on the outer toolbar wing lift.

A starting height when adjusting the toolbar is 19". The toolbar height may need to be adjusted depending upon field conditions.

NOTE: It is important to keep the adjusting nut on the center eye bolt, in the center of the thread adjustment on eye bolts. This will assure proper toolbar height when transporting.

ELECTRIC CLUTCH

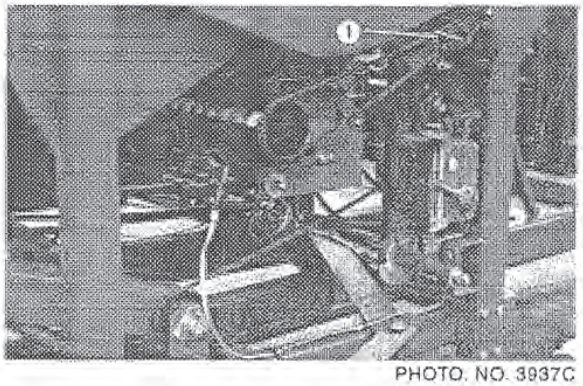


PHOTO. NO. 3937C

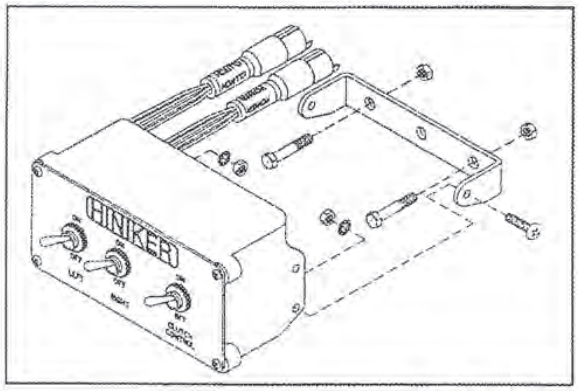
The seed metering mechanism is turned on and off by an electric clutch (arrow 1).
The electric clutch operating parameters are as follows:

VOLTAGE - 12V D.C.
CURRENT DRAW - 4.84 AMPS
RESISTANCE +/- 5% 2.48 OHM

When servicing worn clutch components, the rotor and armature must be replaced as a pair. If service is required for new components, they may be replaced individually.

CONSOLE INSTALLATION

Select an easily accessible area to mount the console in the tractor cab. Mount the bracket to the cab using the 1/4-20 bolts and nuts. Mount the console to the bracket using the #8-32 bolts and nuts.



DWG. NO. 3638

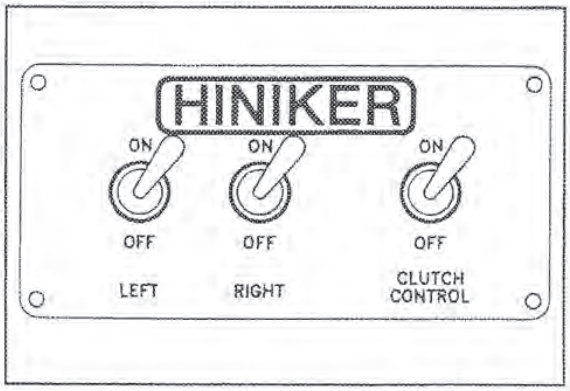
Attaching the lead with the circuit breaker to the positve battery terminal and the remaining lead to the negative terminal.

Route the 10 foot clutch cable from the clutch switch box to the hitch area of the tractor. Connect the 20 foot clutch cable to the 10 foot cable and route along the left tongue to the Seeder bin support. Connect the clutch "y" cable to the 20 foot cable and route to the clutches. The 2 pin connector with the Green and Black wires connects to the clutch on the right side and the 2 pin connector with the Red and Black wires connects to the clutch on the left side. Secure all wiring to the top of frame members to prevent possible damage by pinching or chafing.

NOTE: Allow room at the hitch for proper turning.

CLUTCH OPERATION

The Clutch Control Box has three switches. The two left most switches, labeled Left and Right, will determine which clutches will operate when the Clutch Control Switch is activated. The Clutch Control Switch, located on the right, is the master clutch control. This allows the ability to turn on either or both clutches with one switch.



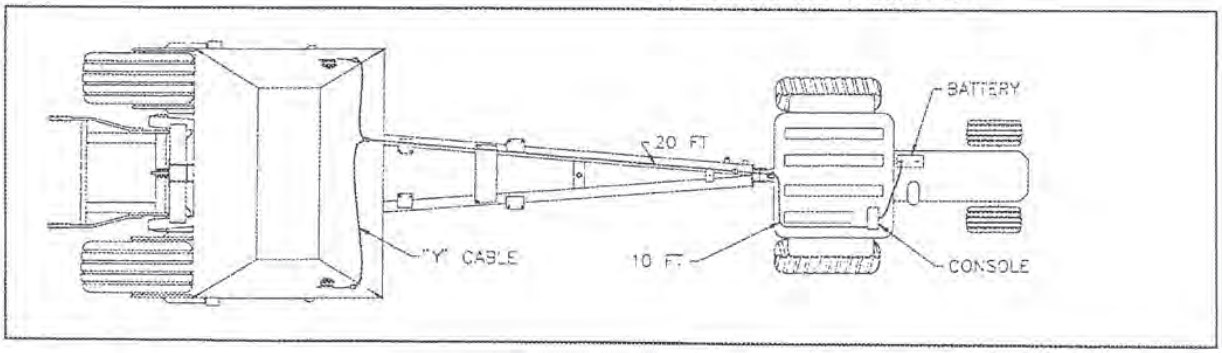
DWG. NO. 3639

Once the electric clutch is turned on, and the electric clutches engage activating the seed metering mechanism, a time delay will occur before the metered seed reaches the disc opener unit.

NOTE: Because the 4800 seeder has a ground wheel drive arrangement, the seeder must be in motion before the seed can be metered and delivered to the ground engaging seed boots.

Because of the previously mentioned start up time delay, "skips" could occur when stopping and starting the 4800 seeder in the field. To prevent these "skips" or unseeded areas, it may be necessary on headlands to turn seeder switch on approximately 10 feet before entering seeding point.

NOTE: Lower seed rates will require a greater distance. To determine correct distance for your seed rate, place a start flag and travel forward. Watch for seed coming out of seed boots, stop and measure that distance.



DWG. NO. 3640

AIR DELIVERY BLOWER

The Hiniker 4800 seeder air delivery blower is designed to be operated with closed center tractor hydraulic systems (tractors with load sensing or pressure-on-demand hydraulics are classified as closed center systems). Open center tractor hydraulics are NOT compatible with system.

Minimum tractor standby pressure required to operate the air delivery blower hydraulic system is approximately 2000 psi at 13 gallons per minute (GPM) depending on frame configuration, planting speed and the number of rows on planter. Some tractors have specific selective control valves for operating hydraulic orbit motors. For complete tractor operating instructions, refer to your tractor operators manual.

To operate the 4800 seeder air delivery blower, first connect the blower hydraulic hoses to the tractor couplers.

Start the tractor engine and bring it up to operating speed.

To engage fan motor, move hydraulic motor selector valve control lever from "float" to a "detent" position.

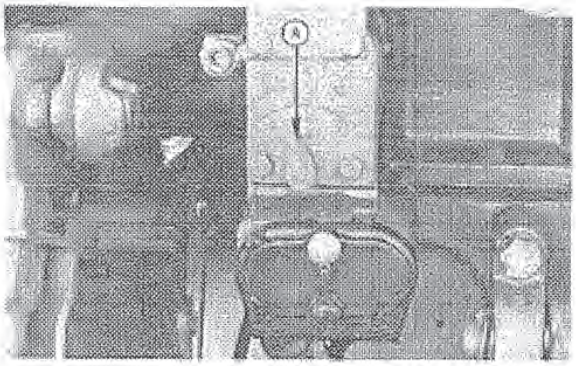
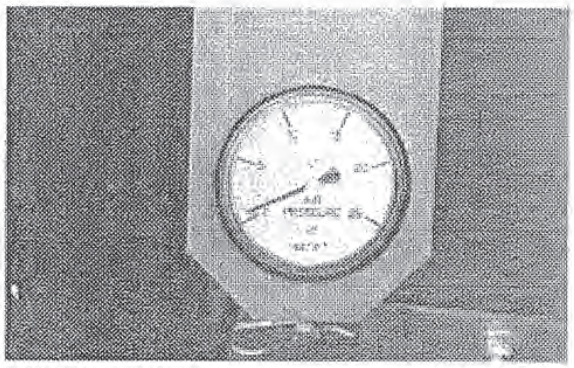


PHOTO. NO. 3098

Use tractor flow control lever "A" and slowly increase rate of flow to bring air pressure indicated on planter seed hopper air gauge (photo 3184) to recommended operational air pressure.



Air Pressure Gauge PHOTO. NO. 3184

When operating at the desired engine and planting ground speed, the air pressure gauge should read from 16 to 20 ounces per square inch for soybeans, 8 to 12 for wheat.

If desired air pressure cannot be obtained check the following:

- Check to see if the tractor coupler flow control is fully open.
- Check to see if the hydraulic blower hoses are properly installed and in the correct tractor couplers.
- Ensure tractor engine speed is properly set.
- Check tractor hydraulic standby pressure and flow to be at 2000 psi and a minimum of 13 gpm.

— Ensure that tractor has a closed center hydraulic system.

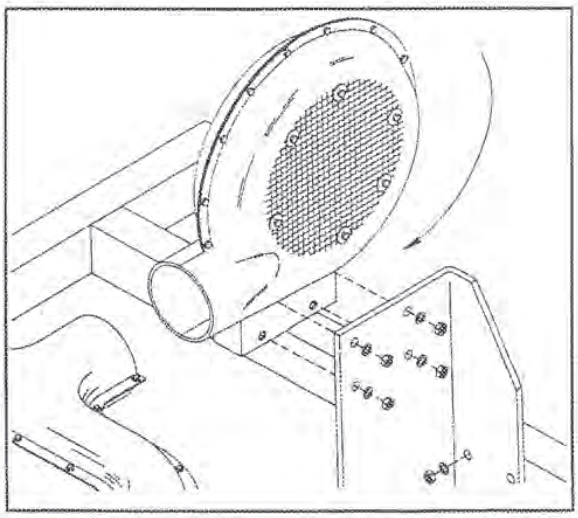
— Check for restrictions in air pressure gauge hose.

— Check to see that hydraulic selector lever is displaced in the proper direction and in a "detent" position.

The hydraulic blower motor is designed to run at a maximum of 4500 rpm.

WARNING: DO NOT REMOVE BLOWER INLET SCREEN TO CHECK BLOWER RPM (REVOLUTIONS PER MINUTE). BLOWER RPM SHOULD BE CHECKED, IF NECESSARY, WITH A STROBE STYLE TACHOMETER WITH THE BLOWER INLET SCREEN IN PLACE.

With the air pressure gauge reading the recommended operation air pressure, the blower should be running within its rpm limits.



BLOWER ROTATION DWG. NO. 3438

The air delivery blower hydraulic motor is of a bi-rotational design meaning it will run in either direction. See drawing 3438 for correct blower rotation.

IMPORTANT: THE BLOWER MUST BE RUNNING AND MAINTAINING MINIMUM SPECIFIED AIR PRESSURE WITH THE DRIVE CLUTCH ENGAGED AND THE MACHINE IN MOTION.

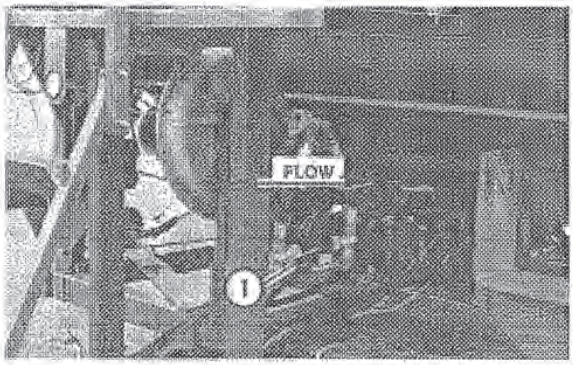


PHOTO. NO. 3960

The blower is provided with a "coasting" feature which allows the blower to free wheel or continue to rotate and coast to a stop once the hydraulic selector lever on the tractor is moved to an "off" or "float" position. A cross over check valve (item 1) in the blower plumbing permits the blower motor to "coast". If the blower motor and blower fan do not free wheel after being turned off, there may be a problem with the check valve (item 1). The inability to "coast" can cause undue stress on the hydraulic orbit motor and its plumbing. If the check valve is removed for cleaning etc. or replaced it must be reinstalled with the "free flow" arrow facing the direction as indicated in photo above.

WARNING: EXCESSIVE AMOUNTS OF DUST OR DIRT TAKEN IN BY THE SEEDER BLOWER COULD CAUSE WEAR TO THE BLOWER IMPELLER. THIS WEAR COULD WEAKEN THE IMPELLER AND POSSIBLY CAUSE IT TO FAIL OR COME APART WHILE RUNNING. FREQUENT IMSPECTION OF THE BLOWER IMPELLER, WHICH CAN BE VIEWED THROUGH THE INLET SCREEN, COULD PREVENT THIS FAILURE AND POSSIBLE INJURY.

WARNING: DO NOT INSERT OBJECTS INTO BLOWER INLET SCREEN OR WORK ON THE BLOWER WHILE THE BLOWER IS RUNNING. SERIOUS PERSONAL INJURY COULD RESULT.

WARNING: DO NOT REMOVE SEED DELIVERY TUBES FROM THE SEEDING UNITS WHILE THE AIR DELIVERY BLOWER IS RUNNING. "PROJECTILES" EXITING THE TUBES UNDER AIR PRESSURE COULD STRIKE AN INDIVIDUAL, POSSIBLY CAUSING SERIOUS INJURY.

MAINTENANCE

When unit is received, inspect immediately for damaged or missing parts. Even though all units are carefully inspected and prepared for shipment at the factory, handling enroute may cause concealed damage or cause nuts, bolts, or locking collars to work loose. If concealed damage is found, call your dealer and report your findings.

BEFORE START UP

1. Inspect all fasteners to make sure they are secure.

   a. Hopper and trailer bolts.

   b. Set screws in fan, housing and motor mounting bolts.

2. Be sure to follow the directions for connection of hydraulic hoses using like-brand connectors as on tractor and in regulating fluid flow for closed center tractors. Failure to do so may result in damage to your hydraulic system.

BLOWER HOUSING AND METAL PARTS

3. The blower housing and impeller are maintenance free and should not require any maintenance during the life of the unit. After operation in dusty conditions, the air intake screen should be removed and the impeller blades cleaned to prevent an accumulation of foreign matter that could interfere with operation of the fan. Inspect periodically to check for possible excessive wear or cracks and check the alignment of the impeller with housing.

MANIFOLD

4. Be sure to clear manifold of collected dust or debris by daily removing expansion plugs in manifold. Failure to do so can cause accumulation which interferes with air passage and delivery material through pneumatic tubes.

DRIVES AND CLUTCHES

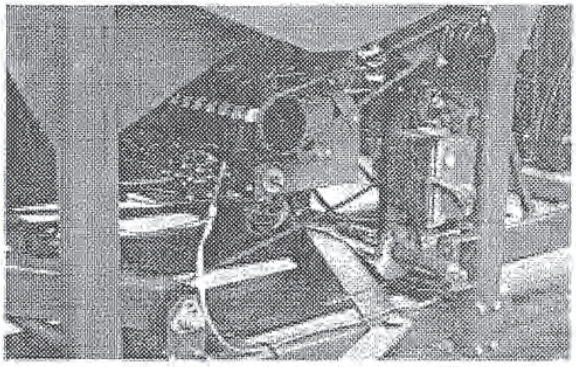


PHOTO. NO. 3937D

Check that roller chain assemblies are properly aligned and roller chain idler are properly adjusted to ensure proper running seed metering. Check for properly aligned seed metering shaft and smooth running.

LUBRICATION

Oil roller chain daily and check oil level in variable speed box as indicated on lubrication page 7.

TROUBLE SHOOTING
NO-TILL CONDITIONS

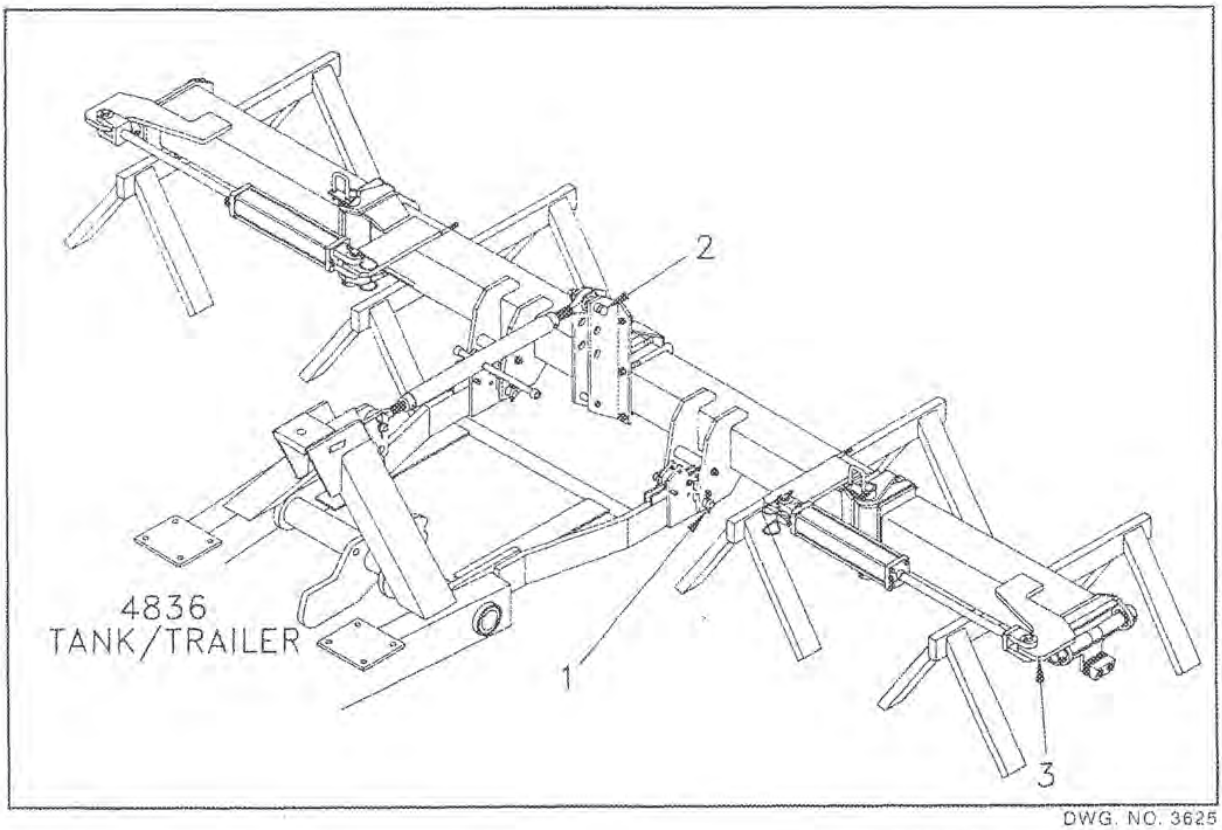
TROUBLE	CAUSE	REMEDY
Residue pushing ahead of disc opener.	Disc not turning.	Gauge wheel set too shallow. Adjust by lifting gauge wheel.
	Residue caught between disc opener and gang.	Raise machine and clean out residue until disc turns freely.
	Disc opener worn too small.	Replace disc.
	Disc opener not turning.	Raise front or lower rear of machine until level.
Residue pushing ahead of gauge wheel.	Gauge wheel not turning.	Disc not penetrating. Increase down pressure or add ballast to toolbar.
	Residue caught between gauge wheel and gang.	Raise machine and clean out residue until gauge wheel turns freely.
Disc opener not cutting residue.	Disc opener pushing	Apply more down pressure on gang and/or add ballast to toolbar.
		Gauge wheel set too shallow. Adjust by lifting gauge wheel.
	Disc opener worn and/or not sharp.	Replace disc opener.
Seed not covered.	Rotary closer not in proper adjustment.	Adjust an angle of rotary closer.
	Not enough down pressure on rotary closer.	Increase down pressure on rotary closer arm.
	Driving too slow.	Must drive minimum 4-5 MPH.
	Field conditions too wet. Soil sticking to disc opener.	Wait for soil to dry.
	Disc opener not penetrating.	Apply more down pressure and/or add ballast to toolbar.
Disc opener slabbing.	Disc opener too deep.	Lower gauge wheel.
	Soil too wet.	Let field dry.

JM-22-0000341

TROUBLE SHOOTING
TILL CONDITIONS

TROUBLE	CAUSE	REMEDY
Residue pushing ahead of gauge wheel.	Gauge wheel not turning. Too much down pressure on gang.	Carry toolbar with tractor. Decrease down pressure on gang. You may have to move position of down pressure spring to negative pressure position.
Residue pushing ahead of disc opener.	Disc opener not turning.	Carry toolbar at 20" off ground. Parallel linkage will be level.
		Too much down pressure. Decrease down pressure on gang.
Disc opener slabbing.	Disc opener too deep.	Lower gauge wheel.
	Field conditions too wet.	Let field dry.
Seed not covered.	Rotary closer not in proper position	Adjust angle of rotary closer.
	Driving too slow.	Must drive minimum 4-5 MPH.
	Disc opener and seed tube set too shallow.	Raise gauge wheel.
SEED BOUNCING OUT OF SEED FURROW	AIR PRESSURE too high -	REDUCE AMOUNT OF Hydraulic oil FLOW to BLOWER FAN. ONLY USE ENOUGH AIR PRESSURE to DELIVER SEED To FURROW.

ASSEMBLY



DWG. NO. 3625

STEP 1

Place center toolbar on stands, holding it 19 inches off floor. Attach 3-point hitch members from 4836 tank/trailer assembly to center tooltbar hitch plate using hitch pin provided. (arrow 1 and 2).

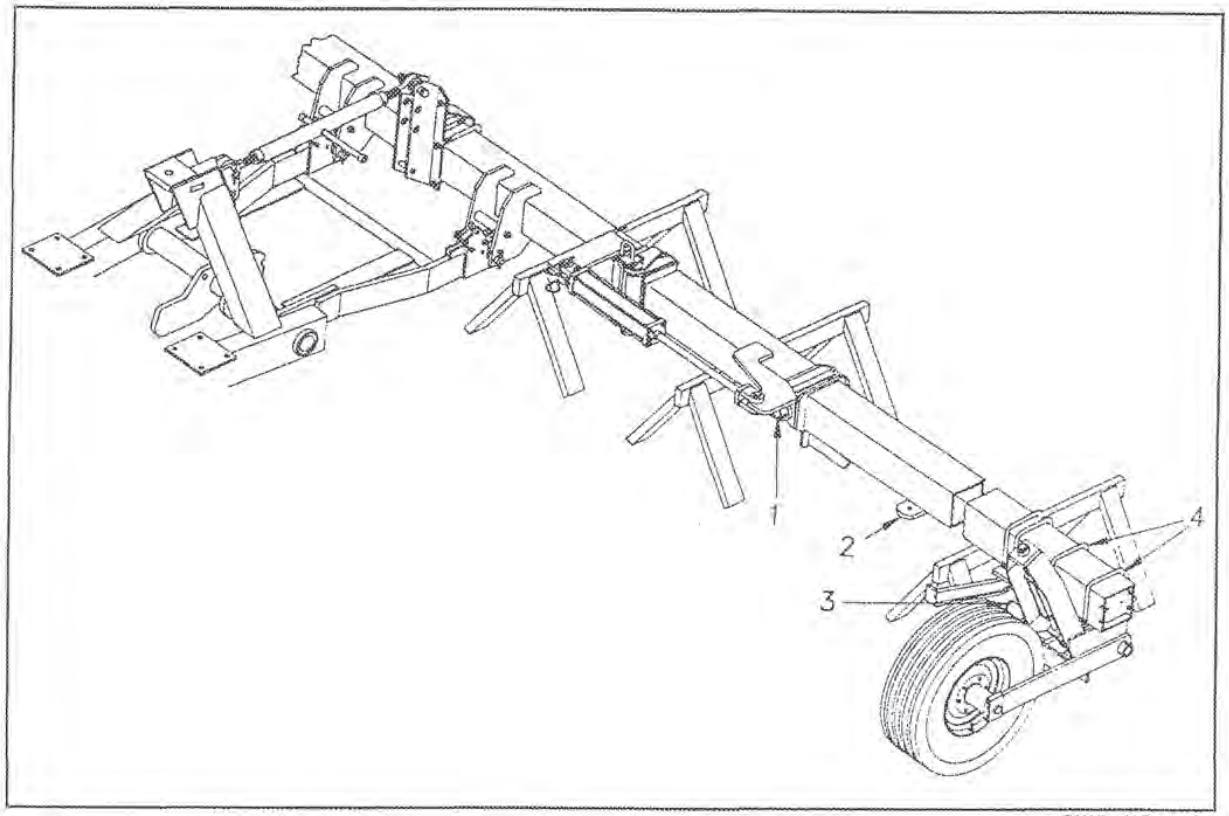
STEP 2

Place both inner wings inline with center toolbar as shown in drawing.

STEP 3

Extend wing fold cylinder and attach to inner wing toolbar (arrow 3) using pin provided.

JM-22-0000343



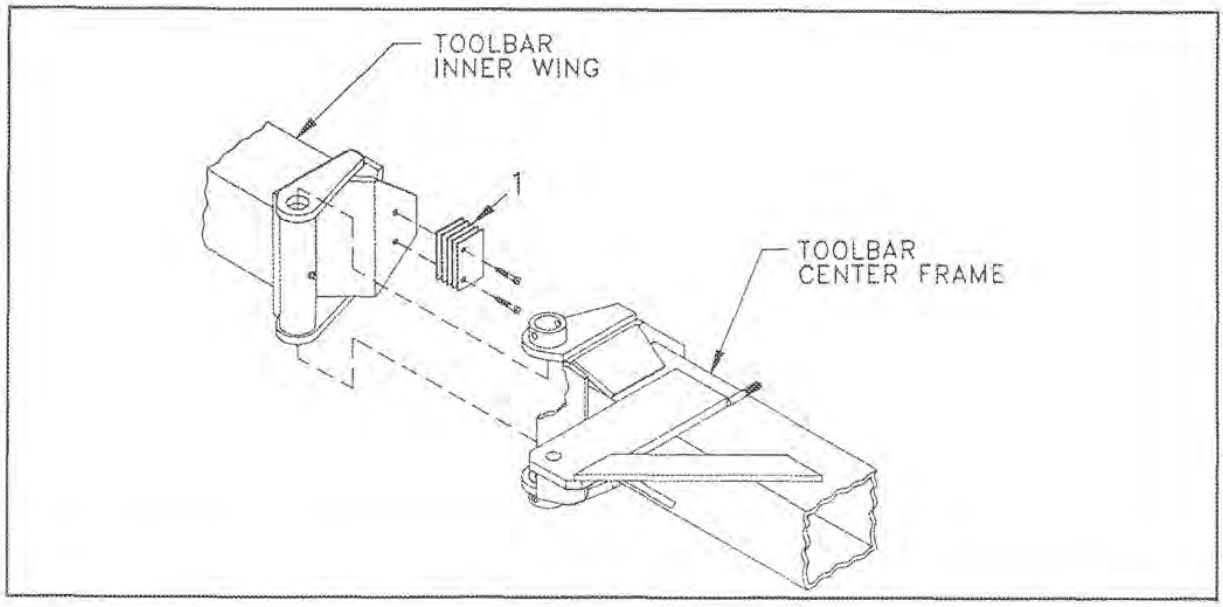
DWG. NO. 3626

STEP 4

Install both outer wings using pivot pin (arrow 1). *NOTE: Drag link anchor (arrow 2) must be installed to front as shown in drawing.*

STEP 5

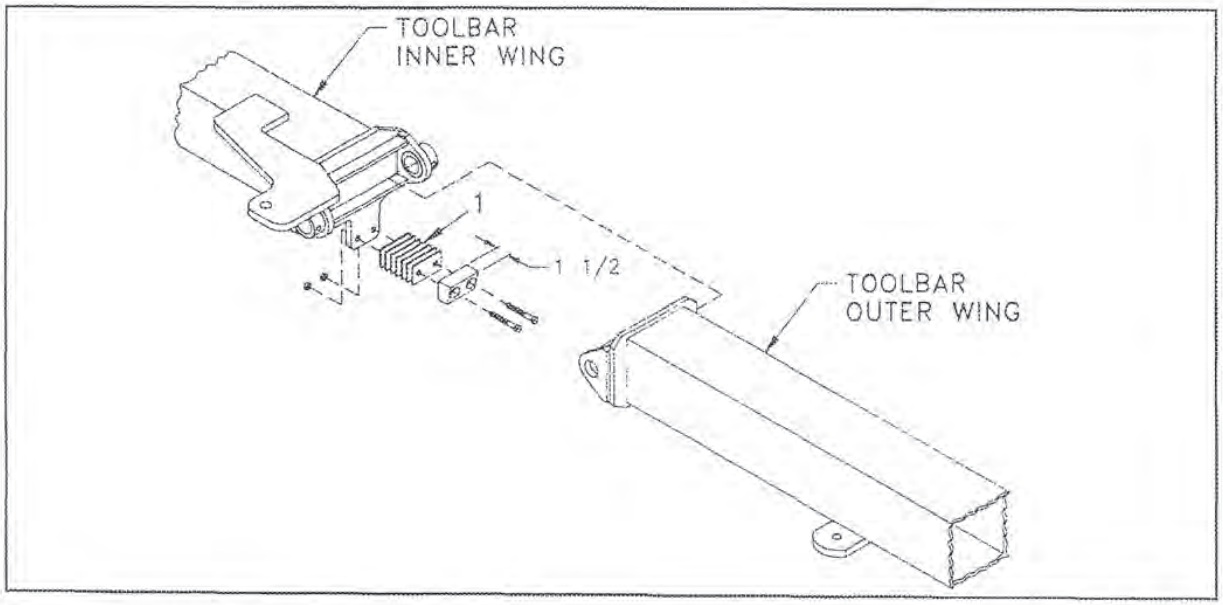
Install left and right wing wheel lift. *NOTE: The roller lock (arrow 3) must be installed on inside.* Install 3/4" u-bolt (arrow 4). Use the Assembly Diagrams for proper placement of Wheel Lift & Toolbar Guide for your model size and row spacing. (Refer to page 49 to 51).



DWG. NO. 3624

STEP 6

Check for proper toolbar alignment between center frame and both inner wings. Adjust number of shim (arrow 1) as required.

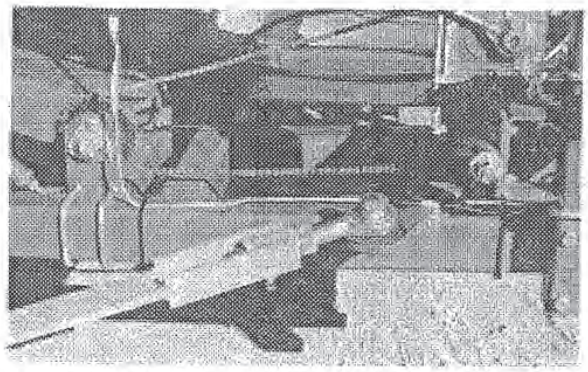


DWG. NO. 3623

Step 7

Adjust for the number of shim (arrow 1) between inner wings and outer wing. *Note: Use (4) shims for 15 inch rows and use (7) shims for 10 inch row spacing.*

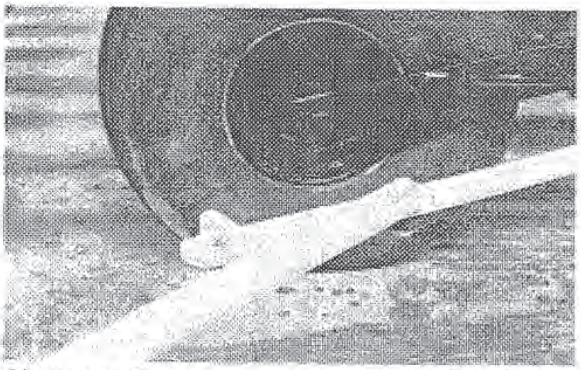
STEP 8



Right Hand Shown PHOTO NO. 3962

Install front drag link using 1 inch hex bolt provided mounting on top of trailer. Pull strap as shown. *NOTE: At this time do not adjust length of eye bolt in drag link.*

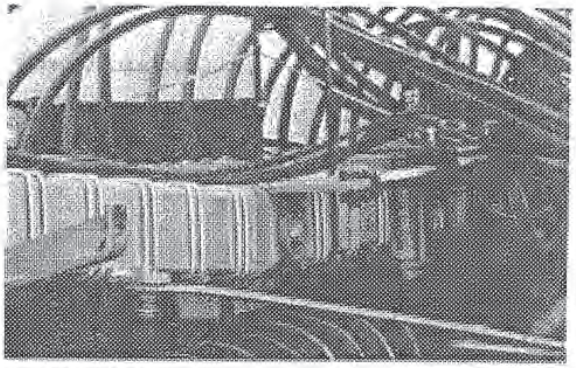
STEP 9



Right Hand Shown PHOTO NO. 3963

When installing drag link assembly the middle pivot and lock must be installed as shown, with Belleville washer on bottom and lock on top.

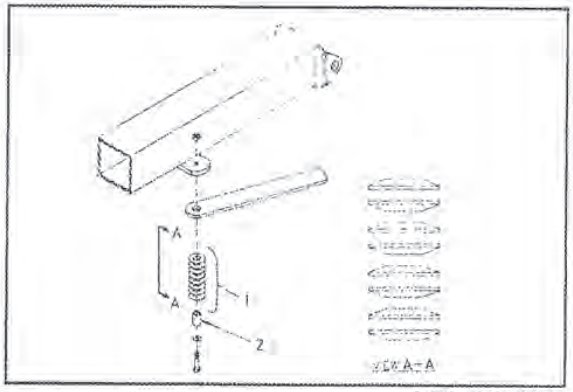
STEP 10



Right Hand Shown PHOTO NO. 3964

Install rear drag link to toolbar outer wing anchor strap as shown. *NOTE: Position of drag link under anchor strap and Belleville washer under drag link.*

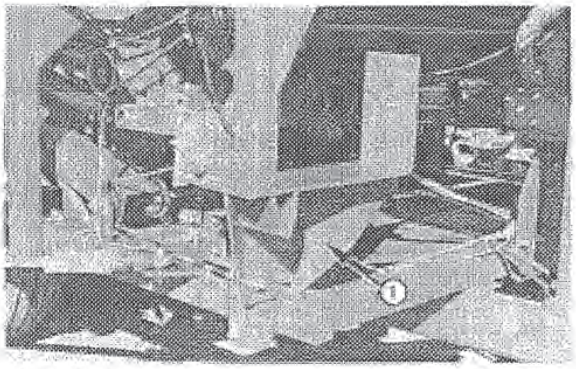
STEP 11



DWG. NO. 3622

When installing Belleville washer (arrow 1), *NOTE: Position of washers to have the beveled sides together as shown in enlarged view.* Also, tighten bolt down on spacer (arrow 2). At that point, the Belleville washer will be at proper tension.

STEP 12A

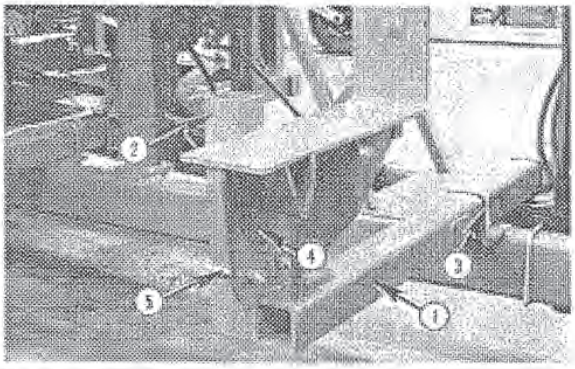


30 Ft. Toolbar
Right Hand Shown

PHOTO NO. 3942A

Reinstall right and left hand wing rest (arrow 1) mounted to the front tank posts using existing 5/8 u-bolts, lockwashers and hex nuts.

STEP 12B



40 Ft. Toolbar
Right Hand Shown

PHOTO NO. 3943A

Install front cross tube weld (arrow 1), center it on trailer tongue. *NOTE: Position of vertical 3 x 4 tube (arrow 2) mounts to the rear.* Install (2) 5/8 bolts (arrow 3) using lockwasher and hex nuts. Reinstall right and left hand wing rest (arrow 4) to the front cross tube, using original (2) 5/8 u-bolt (arrow 5) with lockwashers and hex nuts.

STEP 13

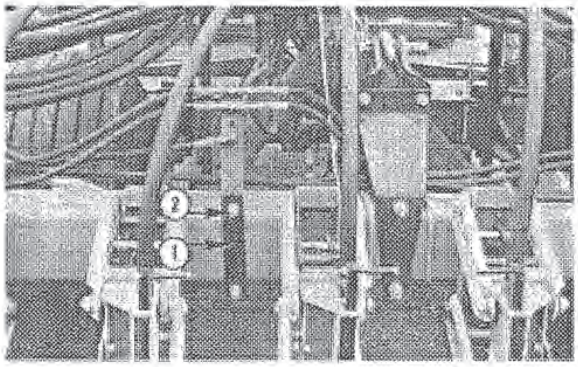
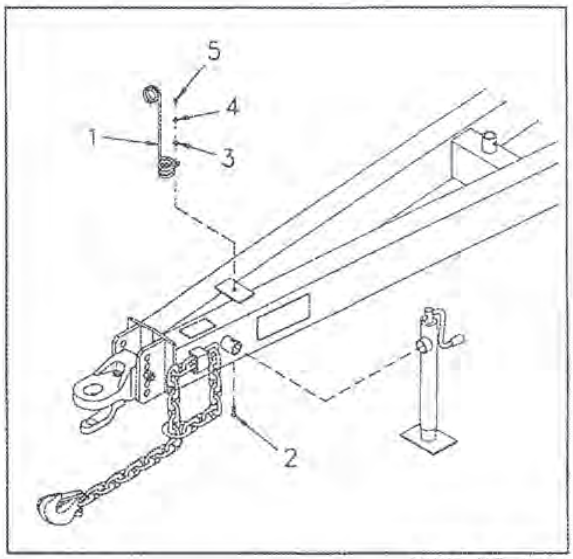


PHOTO NO. 3966

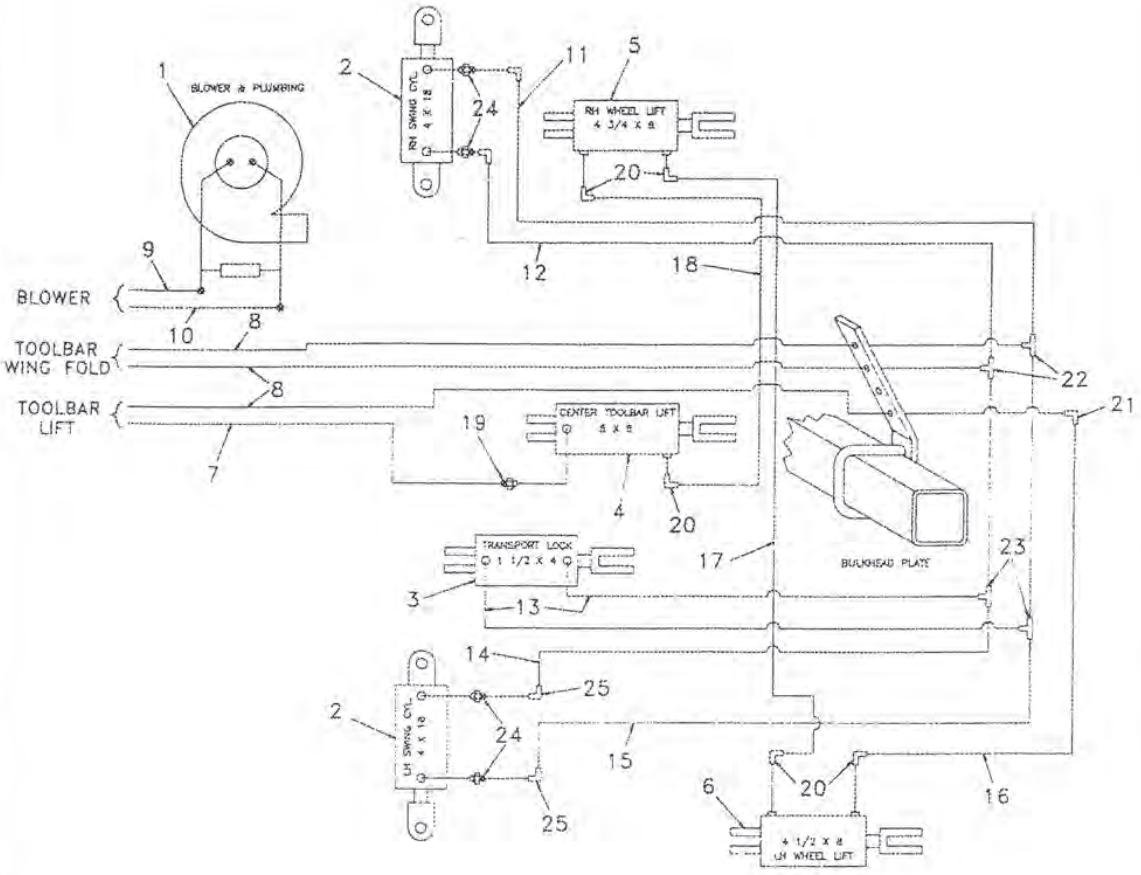
Install bulkhead plate (arrow 1) using 5/8 u-bolt (arrow 2) with lockwasher and hex nuts. *NOTE: Bulkhead plate mounts left of center and between two 4800 disc opener units.*



DWG. NO. 3659

Reinstall front hose stand (arrow 1), from cat walk step. Using (1) 1/2 x 1 1/2 hex bolt (arrow 2) with 1/2 flatwasher (arrow 3), 1/2 lockwasher (arrow 4) and 1/2 hex nut (arrow 5).

HYDRAULIC PLUMBING DIAGRAM



DWG. NO. 3635

REF. NO.	PART NUMBER	DESCRIPTION	QTY	REF. NO.	PART NUMBER	DESCRIPTION	QTY
1	80305265	Blower & Plumbing Assembly	1	16	957-001-034	Hose Assy 3/8 x 180" 30' Toolbar	1
2	81004342	4 x 16 Cylinder Assembly	2		957-001-074	Hose Assy 3/8 x 240" 40' Toolbar	1
3	624001	HYD Cylinder 1 1/2 x 4	1	17	957-001-072	Hose Assy 3/8 x 378" 30' Toolbar	1
4	80305383	5 x 8 Cylinder	1		957-001-076	Hose Assy 3/8 x 498" 40' Toolbar	1
5	80305385	4 3/4 x 8 Cylinder	1	18	957-001-073	Hose Assy 3/8 x 288" 30' Toolbar	1
6	80305384	4 1/2 x 8 Cylinder	1		957-001-075	Hose Assy 3/8 x 348" 40' Toolbar	1
7	957-004-015	Hose Assy 3/8 x 264"	1	19	956-003-001	STR-ADPT 9/16 MJIC x 3/4 MORB w/o Restrictor	1
8	957-004-014	Hose Assy 3/8 x 318"	3	20	956-005-001-	Fitting-Elbow 90° 9/16 MJIC x 3/4 MORB	5
9	957-009-011	Hose Assy 1/2 x 200"	1	21	956-006-002	Fitting-Bulkhead Elbow 90° 9/16 MJIC x 9/16 MJIC	1
10	957-009-010	Hose Assy 1/2 x 210"	1	22	956-007-003	Fitting-Bulkhead Tee 9/16 MJIC x 9/16 MJIC x 9/16 MJIC	2
11	957-001-018	Hose Assy 3/8 x 79"	1				
12	957-001-013	Hose Assy 3/8 x 59"	1	23	956-007-010	Fitting Tee 9/16 FJIC x 9/16 MJIC x 9/16 MJIC	2
13	957-002-020	Hose Assy 3/8 x 66"	2	24	956-008-024	Restrictor Fitting 3/4 MORB x 9/16 MJIC	4
14	957-001-071	Hose Assy 3/8 x 35"	1	25	956-005-002	Fitting-Elbow 90° 9/16 MJIC x 9/16 FJIC	4
15	957-001-061	Hose Assy 3/8 x 56"	1				

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STEP 14

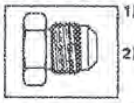
HYDRAULIC PLUMBING

Inspect all hydraulic fittings and hoses for damage, wear, and tightness. Ensure that all hoses are secured to frame in such a manner as to prevent possible damage or wear due to chafing or pinching by moving parts.

NOTE: DO NOT overtighten hydraulic fittings. Fittings should be installed and tightened in accordance with the torque table. Only pipe threaded connections should be treated with a thread sealant compatible to hydraulic systems and the sealant applied to male portion of threads only.

HYDRAULIC FITTING INSTALLATION PROCEDURES AND TORQUE TABLE

SAE Flare Connection



1) Tighten nut finger tight until it bottoms the seat.
2) Using a wrench, rotate nut to tighten. Turn nut 1/3 turn to apply proper torque.

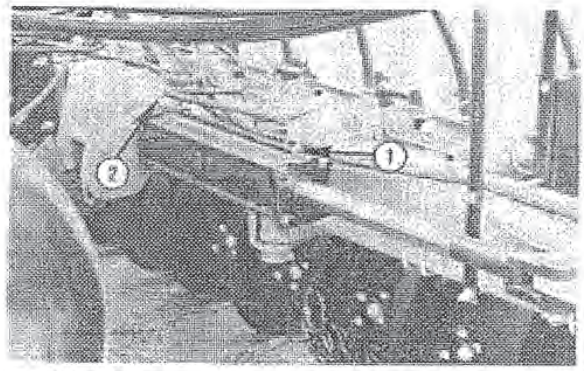
SAE Straight Thread "O" Ring Seal



1) Insure jam nut and washer are backed up to the back side of smooth portion of elbow adapter.
2) Lubricate "O" Ring--VERY IMPORTANT!
3) Thread into port until washer bottoms onto spot face.
4) Position elbows by backing up adapter.
5) Tighten jam nut.

DWG. NO. 1966

STEP 14A



LH SHOWN PHOTO NO. 3935A

Install right and left hand toolbar fold cylinder as shown in photo. *NOTE: Restrictor fittings (arrow 1 and 2).*

STEP 14B

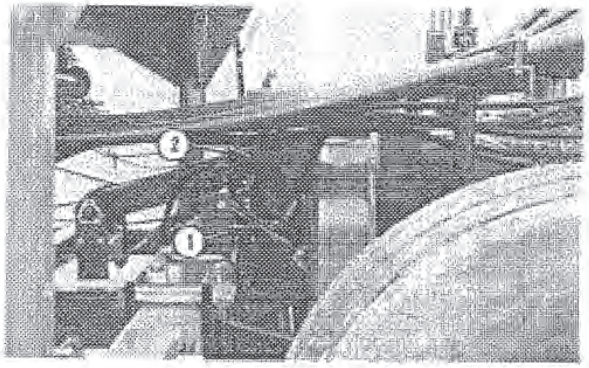
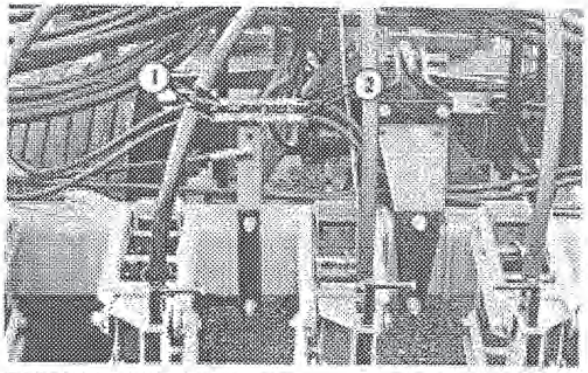


PHOTO NO. 3969

Install hydraulic hoses and fittings to transport lock cylinder (arrow 1) as shown in photo. Install hydraulic hose and fitting to center rockshaft lift cylinder (arrow 2).

STEP 14C

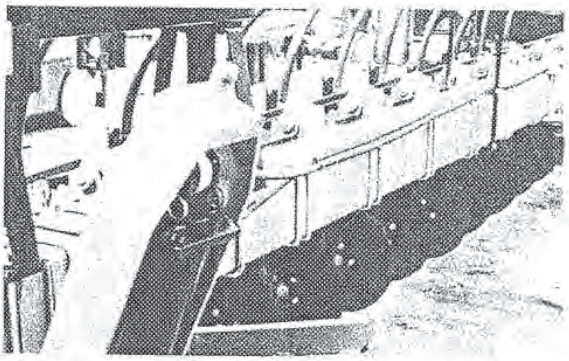


TOOLBAR FOLD PLUMBING DWG. NO. 3966A

Install (2) bulkhead tee fittings (arrow 1) into bulkhead plate. Add (2) inline tee (arrow 2) which runs to transport lock cylinder.

NOTE: 90° bulkhead fitting is return line from left hand wheel lift cylinder.

STEP 14D



RH SHOWN PHOTO NO. 3958A

Install hydraulic hoses and fitting to right and left hand wheel lift cylinder.

NOTE: After 4800 seeder units have been installed, hydraulic hose must be tied up as shown in photo.

STEP 14E

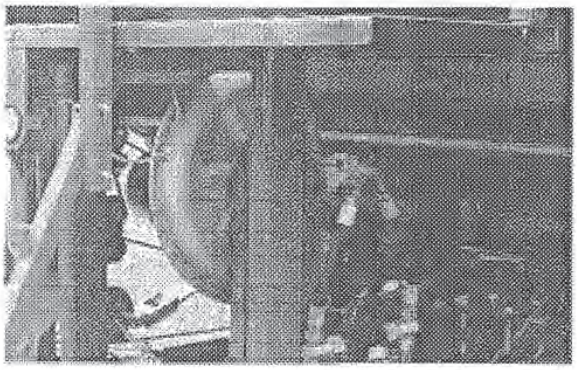
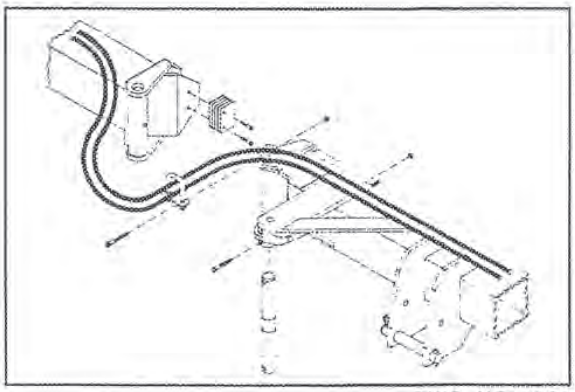


PHOTO NO. 3960A

Install hydraulic hoses to blower plumbing as shown in photo.

STEP 14F



DWG. NO. 3632

Install hydraulic hoses through pivot pin hose guide as shown in drawing.

NOTE: Optional marker hoses will also run through hose guide.

STEP 15

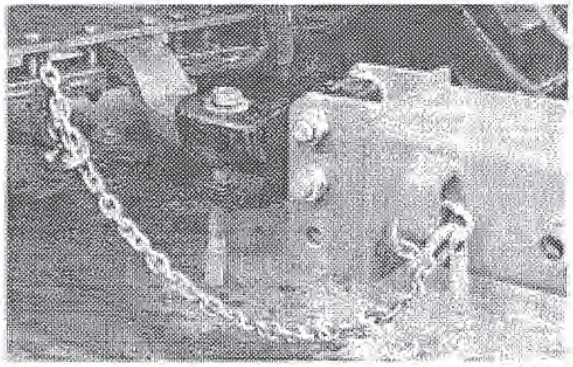


PHOTO NO. 3973

Attach 4836 tank/trailer to tractor hitch, and attach safety chain as shown in photo. Connect all hydraulic lines to tractor outlets.

STEP 16

IMPORTANT: Before operating hydraulic toolbar lift cylinders, all captive air must be removed from system. This may be done by removing cylinder pin from rod end of cylinder and cycling system until system is purged of air. Reattach cylinder rod pin and cautiously cycle toolbar lift through full cycle. Failure to take precaution may result in bodily injury or equipment damage.

Raise toolbar and remove stands from under toolbar. Raise toolbar to highest position.

STEP 17

IMPORTANT: Never operate wing fold cylinders without (4) restrictor fittings part number 956-008-024 for 4 inch cylinder, one at each end of both cylinders. Failure to have restrictors in place may result in body injury or equipment damage.

Fold toolbar forward, only half way at this time. Return toolbar to straight inline and lower toolbar to have bottom of toolbar 19 inches off the ground.

This section should be expanded to include folding the wings.

STEP 18

CAUTION: A lifting device such as crane, loader, or forklift is required for handling large parts and shipping bundles. Do not attempt to remove disc opener units from shipping bundle while in vertical position. Bundle may fall, causing severe injury or death, if not handled with proper equipment. While removing bundling straps, wires, or brackets be certain to keep clear of any parts that may drop. Support heavy sections with hoist or blocks before removing wires or straps.

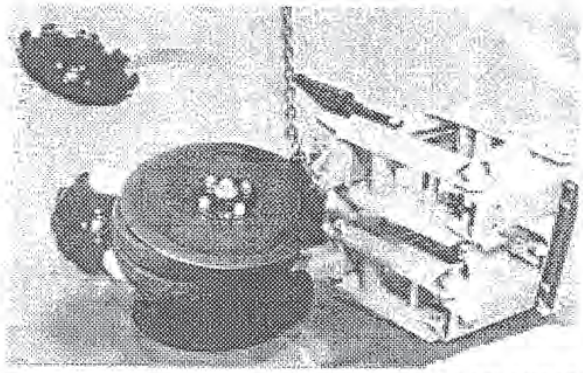


PHOTO NO. 3974A

When moving right and left hand disc opener shipping bundle, attach lift chain around rear mast shank, and between parallel link and gauge wheel, as shown in photo.

CAUTION: When removing any bundling straps, wires or brackets, be certain to keep clear of any parts which may drop. Support heavy sections with hoist or blocks before removing wires or straps.

STEP 19

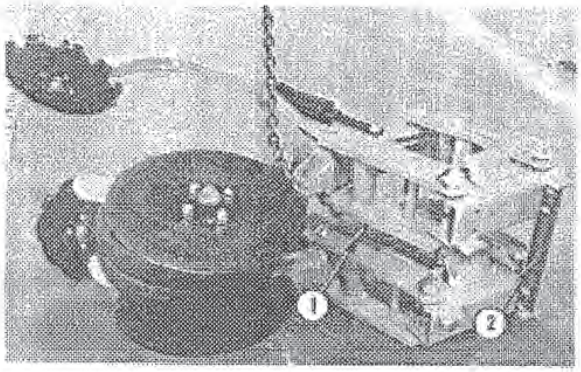


PHOTO NO. 3974

With disc opener shipping bundle laying securely on the floor as shown in photo, cut the shipping band (arrow 1) and unbolt angle strap (arrow 2). Lift top unit off and lay securely on the floor.

STEP 20

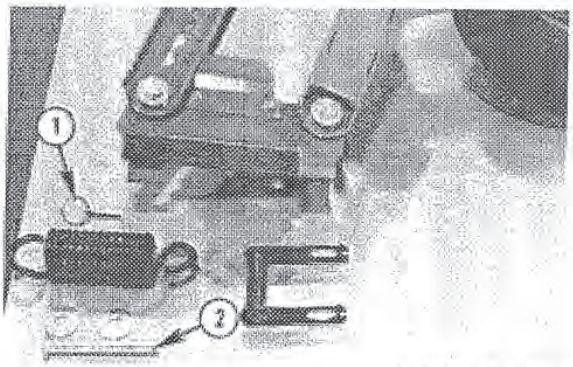
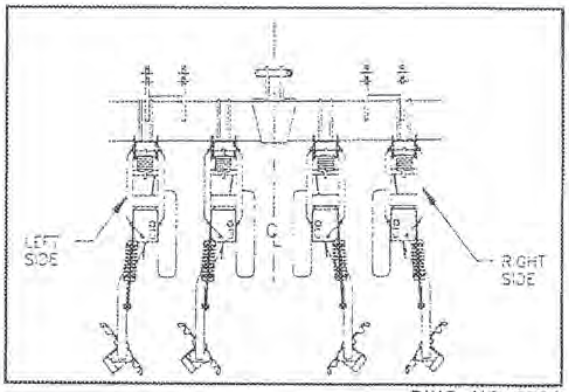


PHOTO NO. 3976

With disc opener laying on the floor, remove down pressure spring assembly. First remove klik pin (arrow 1) and 3/4" flat washer, then 3/4" pin (arrow 2). At this time the spring will be loose inside of disc opener. Set spring and handle aside at this time. It will all be reassembled later.

NOTE: All hardware should be tightened only enough to insure safety during assembly. Torque hardware to specified values, as shown on torque chart on page 8, only after assembly has been completed.

RIGHT AND LEFT SIDE DISC OPENER IDENTIFICATION



DWG. NO. 3634

Notice gauge wheel on inside, starting at toolbar center and the rotary closer support arm offset to outside.

STEP 21

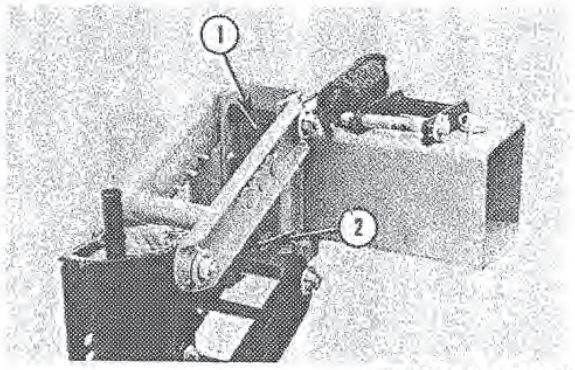


PHOTO NO. 3621A

Before mounting disc opener up to the toolbar, see assembly diagrams on pages 47 to 49 for proper location of disc opener. Move disc opener up to toolbar with front mast locks engaged. Install (2) 1/2 u-bolts (arrow 1) with (4) 1/2 lockwashers and (4) 1/2 hex nuts (arrow 2).

STEP 22

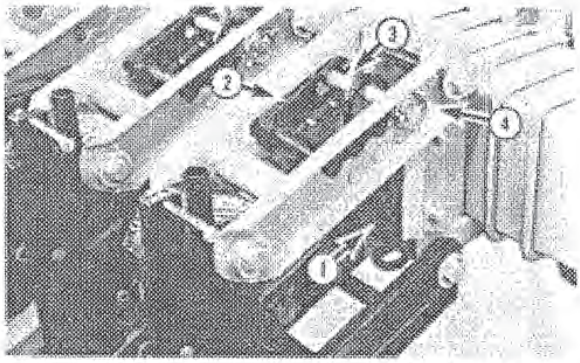


PHOTO NO. 3605A

After disc opener has been mounted up to toolbar and u-bolt and hex nuts are tight, reinstall down pressure spring (arrow 1).

NOTE: The large 1 inch hook opening is at bottom, use front 7/8 diameter rod anchor.

Reinstall adjusting handle (arrow 2) and 3/4" pin (arrow 3) with 3/4" flat washers and klik pin (arrow 4).

STEP 23

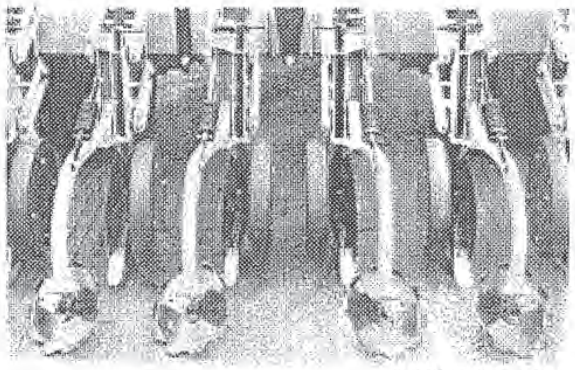


PHOTO NO. 3977

Continue to mount disc openers across the toolbar working from center out.

See Assembly Diagrams on pages 49 to 51 for proper location of disc openers.

STEP 24

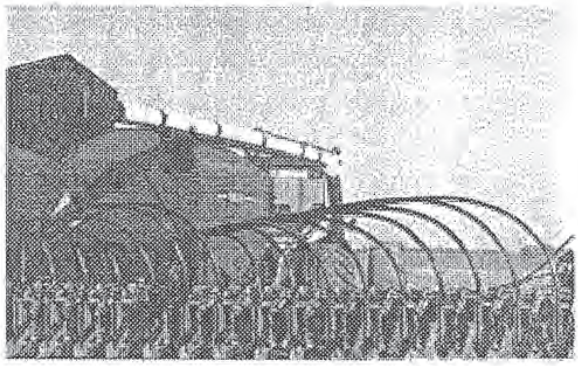


PHOTO NO. 3978

Continue to mount disc opener around hinges and center the last disc opener with the wheel lift, at outer toolbar wing.

STEP 25

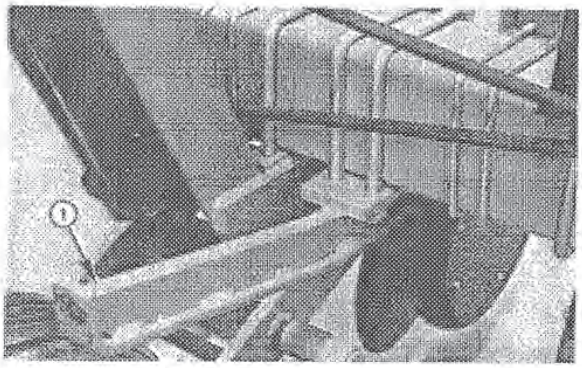


PHOTO NO. 3945A

Raise toolbar up to full height, all five sections will be level at this time. Fold toolbar wings forward until toolbar guide (arrow 1) nose piece will enter wing rest plate. Adjust position of toolbar guide, to be inline with front edge of wing rest plate.

STEP 26

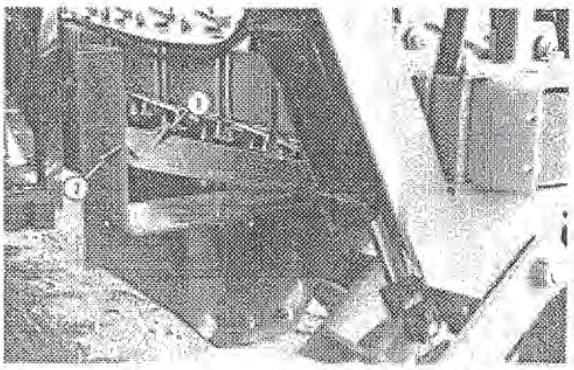


PHOTO NO. 3936B

Fold toolbar wing all the way forward until toolbar guide (arrow 1) hits toolbar rest back stop (arrow 2). *NOTE: Check that both sides are up to back stop before raising wheel lift arms and locking for transport.*

IMPORTANT: When toolbar lowers onto toolbar rest, it will move rearward 2 to 3 inches. Failure to take precaution may result in bodily injury or equipment damage.

STEP 27

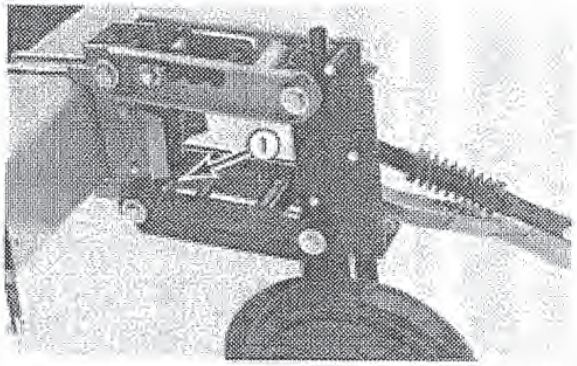


PHOTO. NO. 3627

To insure uniform down pressure on all disc openers, check that the down pressure spring bottom hook is anchored on front 7/8 diameter tube.

NOTE: This should be a start position for all units.

STEP 28

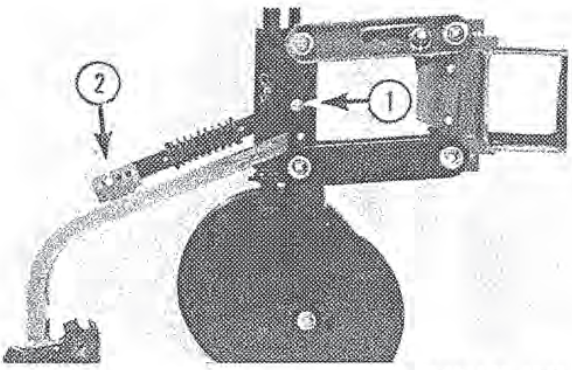


PHOTO NO. 3626

Check for uniform rotary closer down pressure strap anchor location front and rear. If required move front into middle hole on rear mast (arrow 1). Move rear anchor into third hole (arrow 2) as shown in photo.

NOTE: This should be a start position for all units.

STEP 29

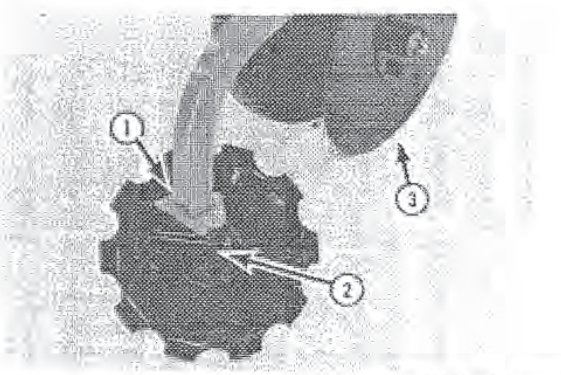


PHOTO NO. 3628

To insure uniform angle on all rotary closers, check that all units are flush at front edge (arrow 1) and the rotary closer bearing (arrow 2) is on the same side as the disc opener coulter (arrow 3).

NOTE: This should be a starting angle for all units.

STEP 30

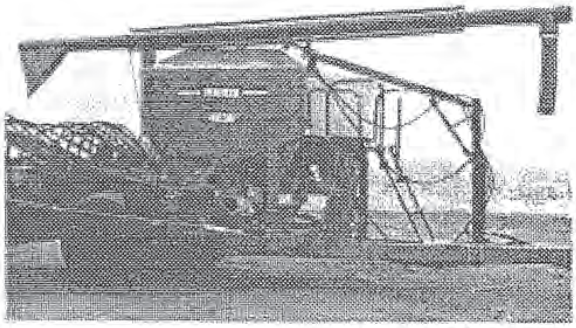


PHOTO NO. 3981

Install seed tube run from seed tank outlet to disc opener. See assembly diagrams on page 49 to 51 for proper length and position of hose running through hose guides.

STEP 31

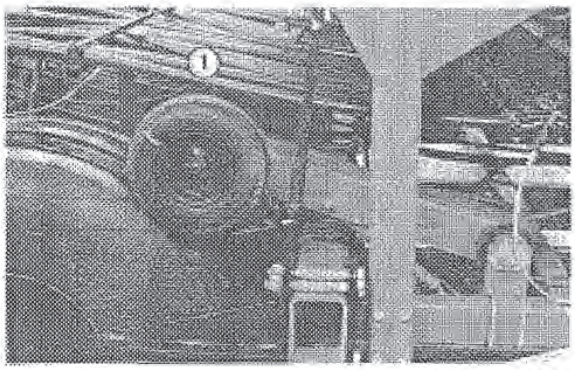
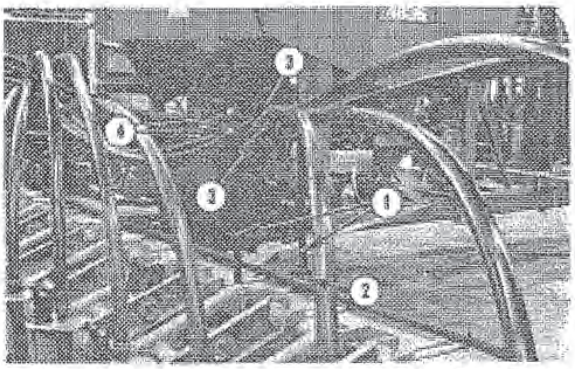


PHOTO NO. 3982

Install seed through front hose rest (arrow 1).

NOTE: Drive wheel must have clearance over top of the tire.

STEP 32
40 FOOT TOOLBAR ONLY



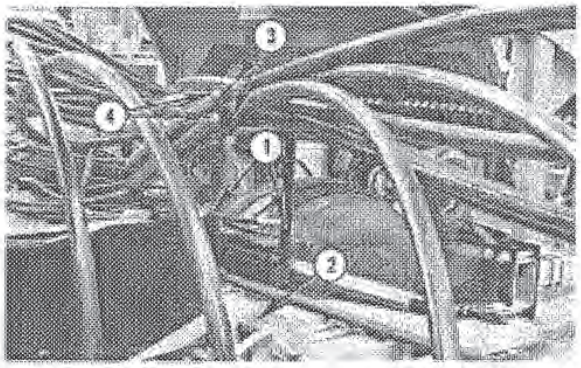
RH Shown

PHOTO NO. 3983

Install (2) outer wing seed tube support straps (arrow 1) using (2) 1/2 x 8 1/2" hex bolt (arrow 2) with lockwasher and hex nuts. Install (2) cross straps (arrow 3) using (4) 3/8 x 1 1/2" hex bolt (arrow 4) with lockwasher and hex nuts.

NOTE: Number of seed tubes in support stand from outer toolbar disc openers.

STEP 33
30 & 40 FOOT TOOLBAR

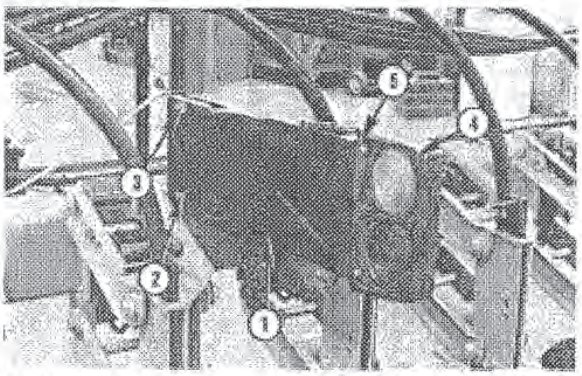


RH Shown PHOTO NO. 3984

Install (2) inner wing seed tube support and vertical strap (arrow 1) using (2) 1/2 x 8 1/2" hex bolt (arrow 2) with lockwasher and hex nut. Install cross straps (arrow 3) using (4) 3/8 x 1 1/2" hex bolt (arrow 4) with lockwasher and hex nuts.

NOTE: Number of seed tubes in support stand.

STEP 34



RH Shown PHOTO NO. 3985

Install right and left hand light mount bracket (arrow 1) using (1) 1/2 x 8 1/2" hex bolt (arrow 2) and (1) 3/8 x 1 1/2" hex bolt (arrow 3) with lockwasher and hex nuts. Install light (arrow 4) use (4) 1/4 x 1 1/4" hex bolts (arrow 5) with 1/4" whiz nuts.

NOTE: Amber and red light will be visible from rear when toolbar is in transport.

STEP 35

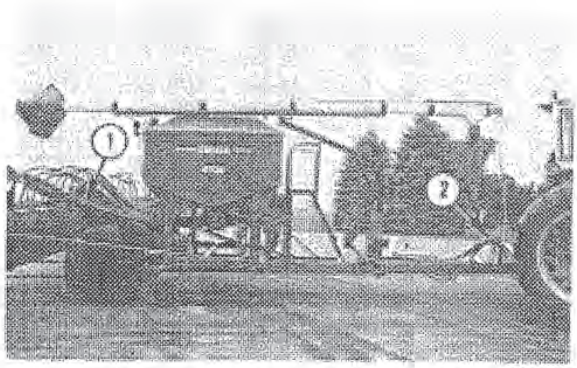


PHOTO NO. 3986

Continue to install all electrical wires using wiring diagram on page 22. Run rear light wire through rear pivot pin holder (arrow 1) and front 7-point plug wire through front loop (arrow 2).

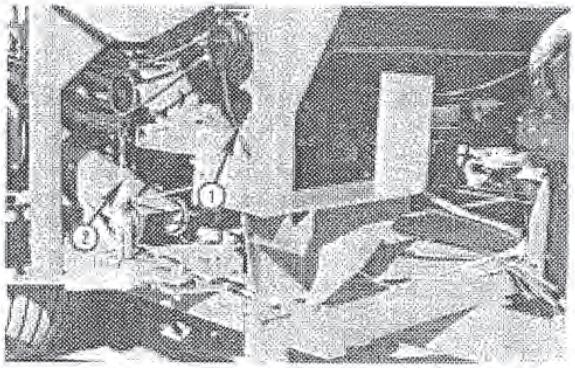
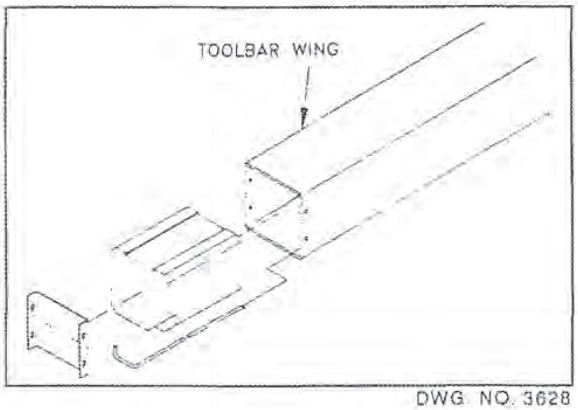


PHOTO NO. 3942B

Continue to install dual electric clutch wiring (arrow 1) and blocked seed detector (arrow 2). Use wiring diagram on page 22.

ASSEMBLY OPTIONAL EQUIPMENT

BALLAST WEIGHT



DWG. NO. 3628

To add additional weight to toolbar, concrete blocks can be ordered. Install concrete blocks as shown. *NOTE: Position of block pull rod and large corner notch to the inside.*

QUANTITY REQUIRED RIGID TOOLBAR	
30 Foot Toolbar	22
40 Foot Toolbar	38

ORDER ITEM NUMBER	DESCRIPTION
810-001-176	Concrete block 22 lbs. each.

WEIGHT BRACKET

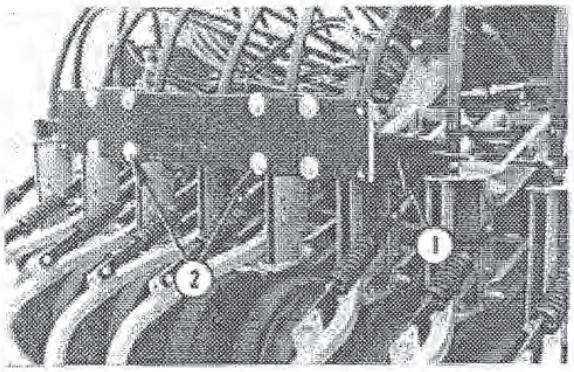


PHOTO. NO. 3988

Install tractor front suitcase weight mounting bracket (arrow 1), using (4) 5/8" u-bolts and (8) 5/8" lockwashers and (8) hex nuts (arrow 2).

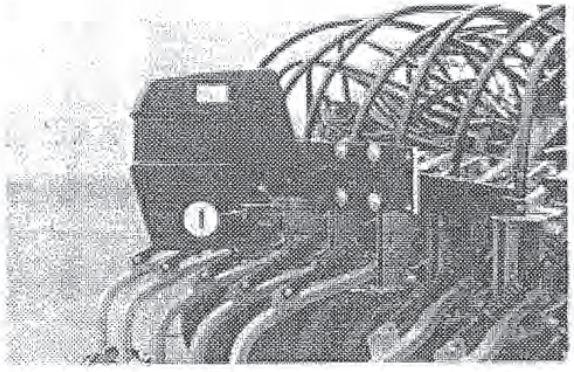


PHOTO NO. 3989

Case/IH suitcase weights fit this mounting. The clamping lock (arrow 1) fits on the bottom edge of mounting bracket.

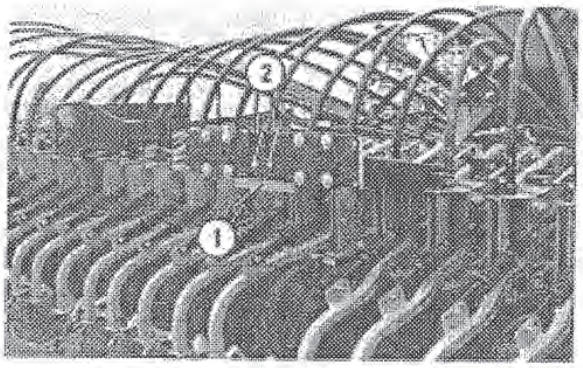


PHOTO NO. 3990

To fit JD suit case weights, lower support (arrow 1) must be installed using (2) 5/8 x 2" carriage bolts with (2) 5/8 lockwashers and (2) 5/8 hex nuts (arrow 2).

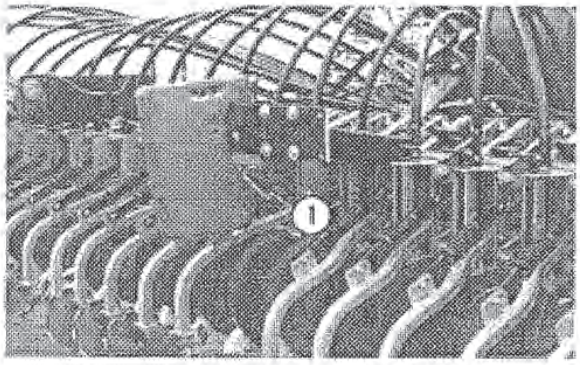
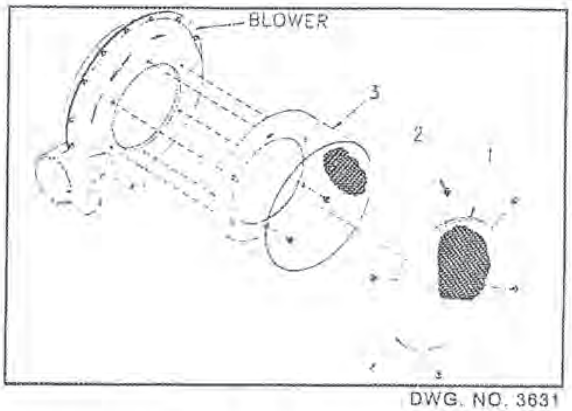


PHOTO NO. 3991

Shown in photo: JD suitcase weight attached to weight bracket assembly. Notice locking stud in the middle (arrow 1). A minimum of (2) suit case weights must be used. Secure with through bolts.

ORDER ITEM NUMBER	DESCRIPTION
80305512	WEIGHT BRACKET COMPONENTS

AIR BLOWER SCREEN



DWG. NO. 3631

To avoid clogging the air inlet screen of the air blower with possible debris, a cylindrical screen is offered as an option. The cylindrical screen has a larger surface area compared to the flat screen offered with the 4836 tank/trailer. The additional surface area still allows enough air to flow into the air blower even if debris begins to clog the screen.

The cylindrical screen is attached to the blower using the (6) 1/4" self tapping screws and washers that are currently used to attach the flat screen onto the blower. The screen cover is attached to the cylindrical screen with (6) 1/4" self tapping screws which are included with this option.

ORDER ITEM NUMBER	DESCRIPTION
80305510	BLOWER SCREEN COMPONENTS

FILL AUGER

A fill auger can be ordered as an option with the unit. You have a choice of either an auger made by Kasco Manufacturing or Remlinger Manufacturing. Included with the fill auger are the components needed for it's support. The fill auger support is attached to the trailer and allows the fill auger to rotate easily for use in the field or for transporting.

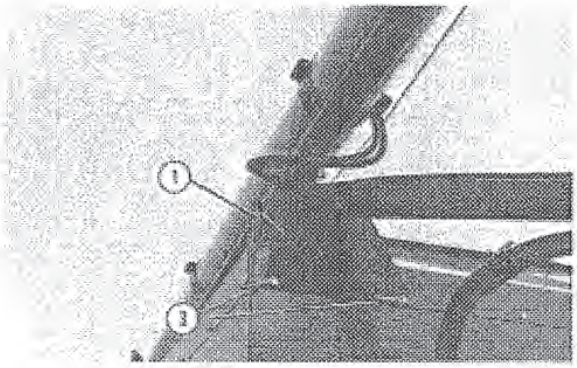


PHOTO NO. 3992

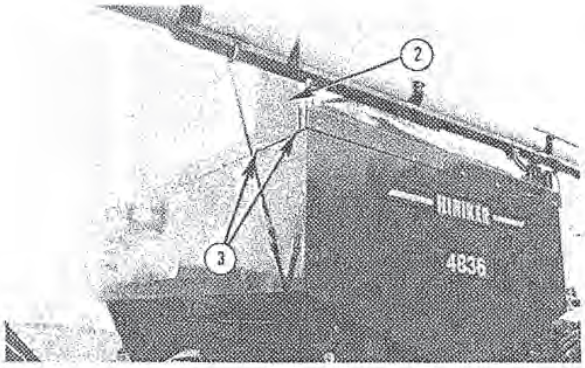


PHOTO NO. 3993

First, the front and rear support brackets must be attached to the tank. Two people will be needed for this operation. The front bracket (arrow 1) is attached at the front of the tank on the right side. The rear bracket (arrow 2) is attached at the rear of the tank, also on the right side. The brackets are attached by first removing the first (2) 5/16 whiz lock bolts (arrow 3) on the right side of the tank. One person will need to get inside the tank to hold the whiz lock nuts as the bolts are being removed. Next, line up the bottom holes of the support brackets with the holes left from the screws, as shown in the pictures above. Nov, re-insert the whiz lock bolts and nuts.

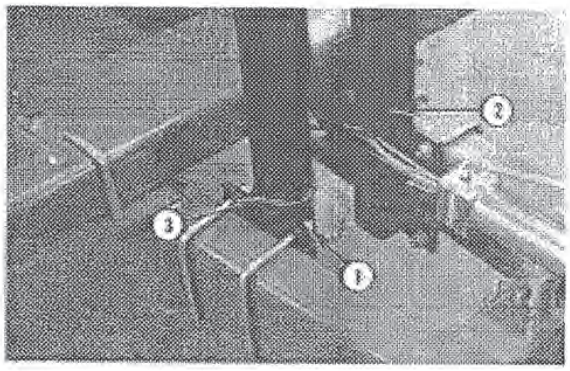


PHOTO NO. 3994

Attach the outer tube weld (arrow 1) to the right trailer tongue in front of the front mounting plate, using (2) of the 5/8" u-bolts provided.

Attach the lower support weld (arrow 2) to the left side of the trailer in front of the front mounting plate, using the other (2) 5/8" u-bolts. Make sure the upper braces of the lower support weld face toward the center of the trailer.

Set the spacer (arrow 3) on top of the outer tube weld.

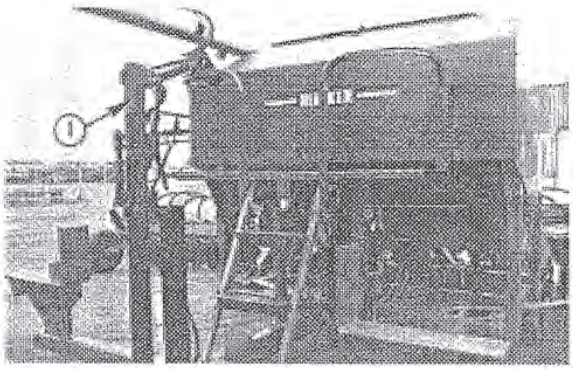
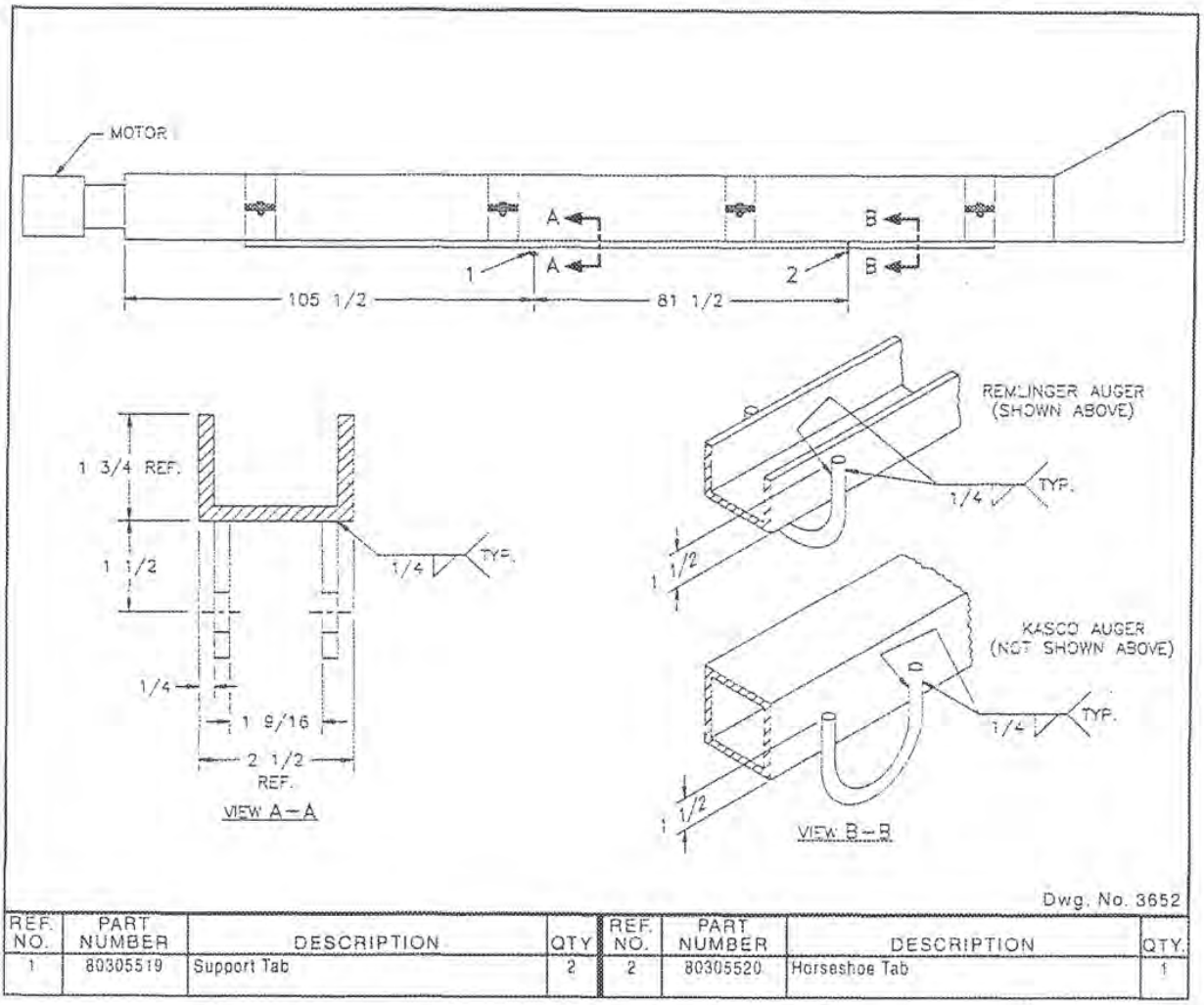


PHOTO NO. 3995

Insert the vertical tube weld (arrow 1) so the bottom of the weld goes through the outer collar of the lower support weld, the spacer and the outer tube weld. The collar of the vertical tube weld should line up inside the collar of the lower support weld. Some adjustment may be needed with the placement of the outer tube weld and lower support weld on the trailer to assure proper alignment for the vertical tube weld to be inserted.



Dwg. No. 3652

REF. NO.	PART NUMBER	DESCRIPTION	QTY	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	80305519	Support Tab	2	2	80305520	Horseshoe Tab	1

NOTE: If auger is not balanced properly, the auger clamps can be loosened, and the auger moved forward or backward, depending upon proper balance of the auger.

REMLINGER AUGER

To prepare the Remlinger Auger for proper installation, a small amount of welding is needed. Two support tabs need to be welded to the channel, as shown in view A-A of the drawing above. A horseshoe tab also needs to be welded to the channel, as shown in the top drawing of view B-B. The horseshoe tab must be welded 81 1/2 inches from the support tabs. After installing the auger onto the support, if auger is not balanced properly, the clamps can be loosened and the auger moved until it is balanced.

KASCO AUGER

To prepare the Kasco Auger for proper installation, a small amount of welding is needed. Unlike, the Remlinger auger, the support tabs are already welded to the tubing provided with the auger. The horseshoe tab still needs to be welded 81 1/2 inches from the support tabs as shown in the bottom drawing of view B-B. After installing the auger onto the support, if auger is not balanced properly, the clamps can be loosened and the auger moved until it is balanced.

Once the vertical tube weld has been inserted properly, tighten the 5/8" u-bolts to torque and insert the 3/8" bolt and nut to the bottom of the vertical tube weld.

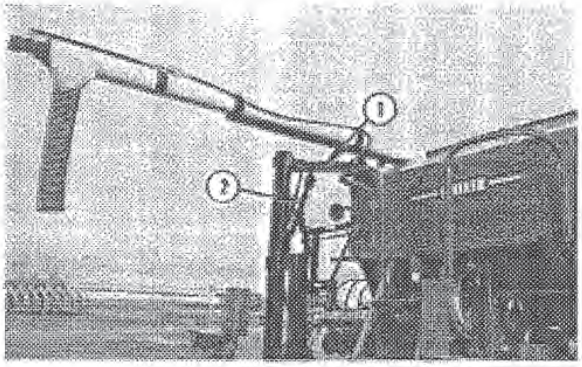


PHOTO NO. 3996

Attach the swing arm weld (arrow 1) to the vertical tube weld. Line up the holes on the square tubing of the swing arm with the holes on the swing arm supports of the vertical tube weld, and insert the 3/4" bolt and nut. The ratchet jack (arrow 2) can be attached to the ratchet jack supports on the swing arm and the vertical tube weld as shown in the picture above.

ORDER ITEM NUMBER	DESCRIPTION
80305509	FILL AUGER COMPONENTS

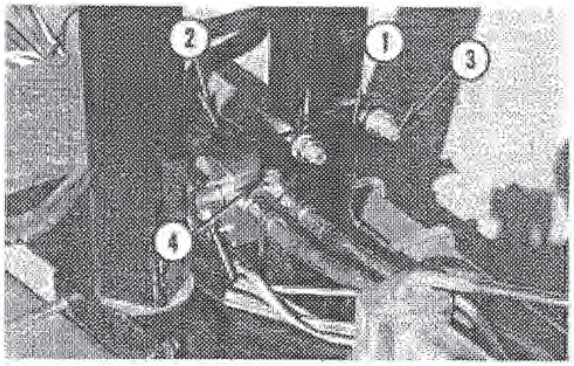


PHOTO NO. 3997

Install hydraulic selector valve using selector valve anchor (arrow 1) and rear strap (arrow 2) with (2) 3/8 x 4" hex bolt (arrow 3) and (2) lockwashers and hex nuts. Install (1) 5/16 x 1 3/4" hex bolt (arrow 4) with whiz lock nut. Install hydraulic plumbing as shown in diagram on page 47.

MARKERS

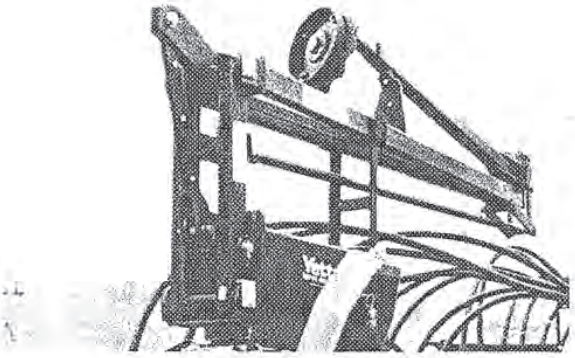


PHOTO NO. 3964

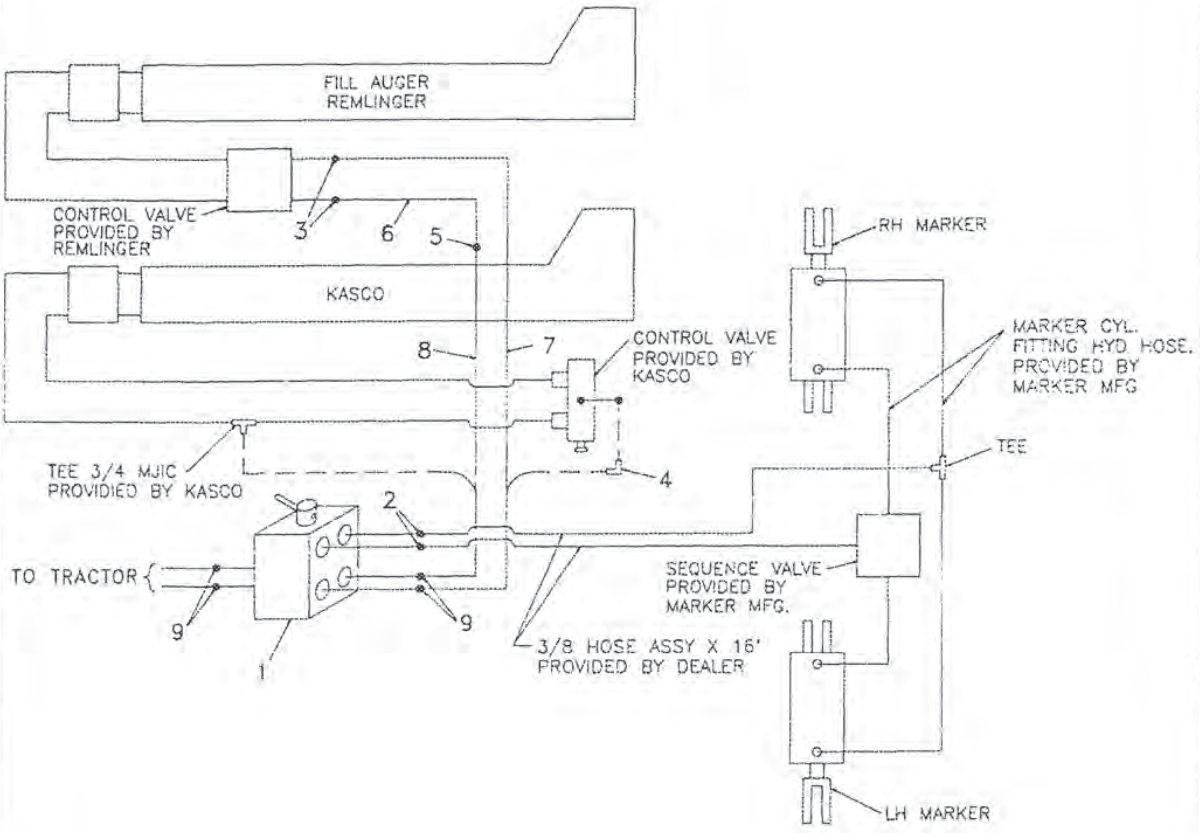
NOTE - Contact:

Yetter Manufacturing Co.
1-800-447-5777
Colchester IL. 62326-0358

for complete marker assembly with mounting brackets. 6150 Series Hydraulic Flat Folding Marker shown in photo.

Additional assembly instructions is shown on page 48, Fitting Yetter 6150 Marker on 4800 Air Drill.

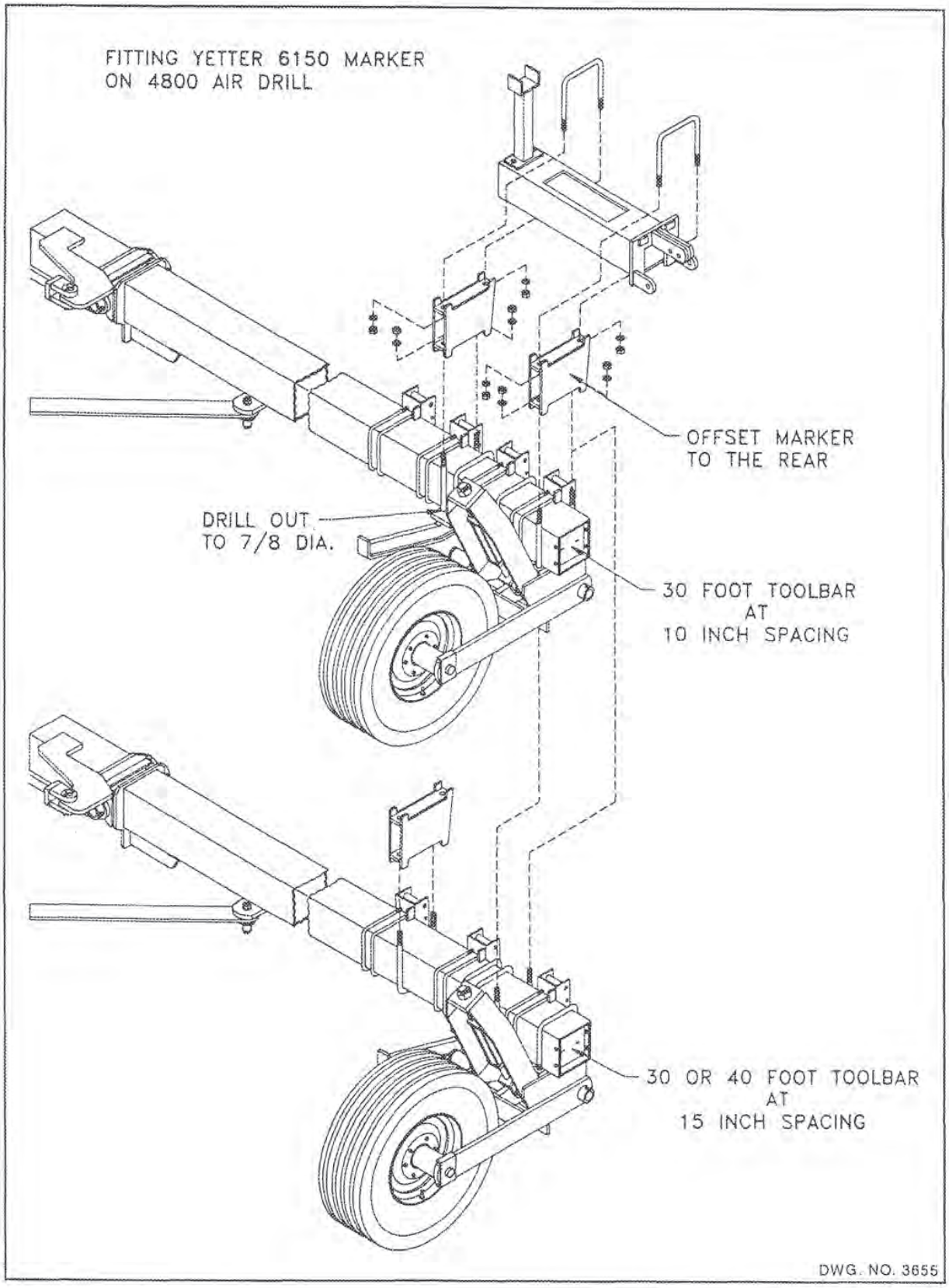
HYDRAULIC PLUMBING DIAGRAM FOR OPTIONAL FILL AUGER & MARKERS



DWG. NO 3636

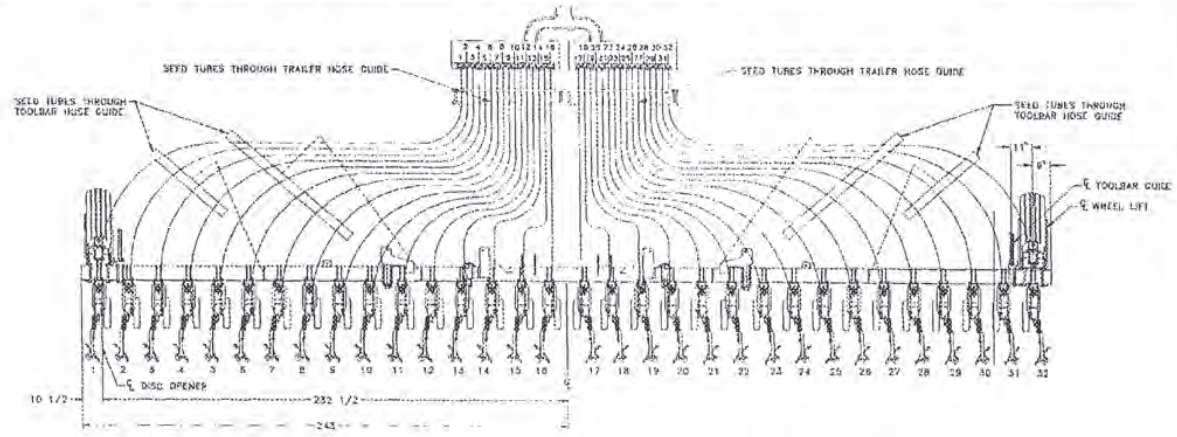
REF. NO.	PART NUMBER	DESCRIPTION	QTY	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	80305516	HYD Valve	1	5	206-01019	Union 3/4 MJIC (2)	1
2	203-35510	O-Ring Pipe Plug	2	6	957-005-021	Hose Assy 3/8 x 50"	1
3	956-003-003	Fitting-Straight Adapter 1/2 MNPT x 9/16 MJIC	2	7	957-001-074	Hose Assy 3/8 x 240"	1
				8	957-005-003	Hose Assy 3/8 x 191"	1
4	956-005-003	Fitting-Elbow 90° 1/2 MNPT x 9/16 MJIC	1	9	956-003-001	STR-ADPT 9/16 MJIC x 3/4 MORB	4

JM-22-0000362



JM-22-0000363

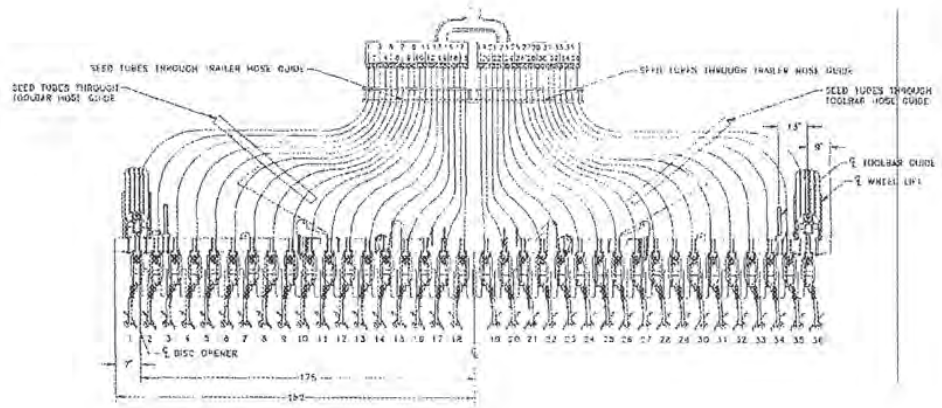
4633 40 FOOT 32 ROW 15 INCH SPACING																	TOTAL HOSE LENGTH RECAP
SERIES 4800 AIR SEEDER	283 INCHES	268 INCHES	253 INCHES	238 INCHES	223 INCHES	208 INCHES	193 INCHES	178 INCHES	164 INCHES	154 INCHES	148 INCHES	141 INCHES	134 INCHES	129 INCHES	127 INCHES	122 INCHES	492 FEET
HOSE NUMBER	1 & 32	2 & 31	3 & 30	4 & 29	5 & 28	6 & 27	7 & 26	8 & 25	9 & 24	10 & 23	11 & 22	12 & 21	13 & 20	14 & 19	15 & 18	16 & 17	



DWG. NO. 3633

4832 30 FOOT 36 ROW 10 INCH SPACING

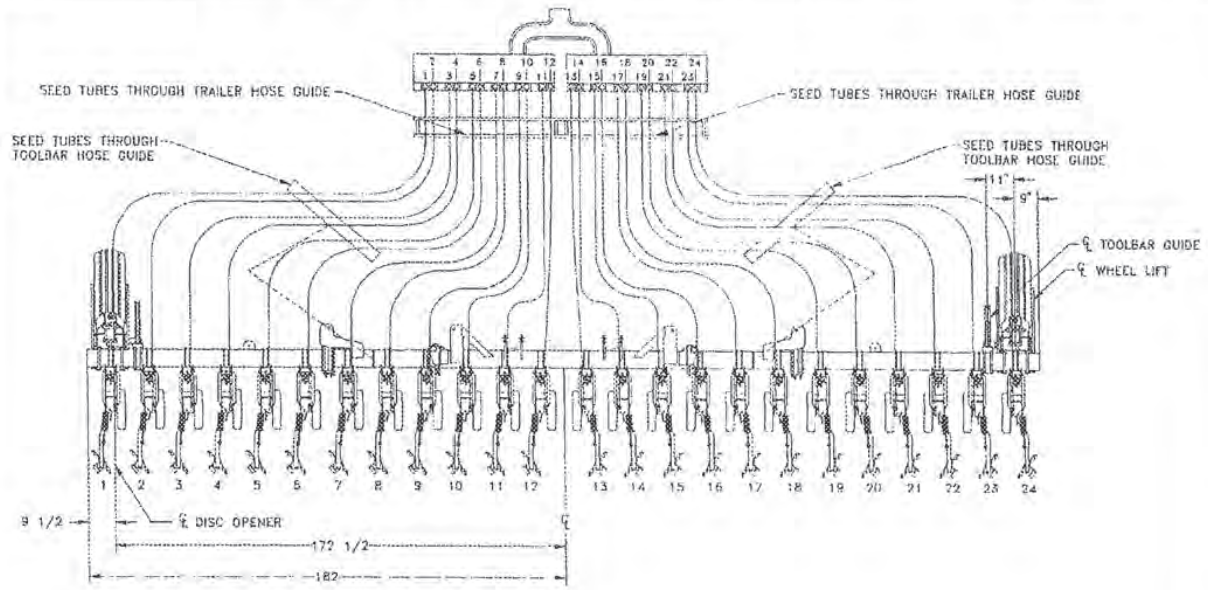
OPENER 6909 4IN SEEDER	282 INCHES	212 INCHES	200 INCHES	192 INCHES	185 INCHES	177 INCHES	165 INCHES	157 INCHES	151 INCHES	141 INCHES	116 INCHES	98 INCHES	105 INCHES	131 INCHES	126 INCHES	124 INCHES	119 INCHES	118 INCHES	TOTAL HOSE LENGTH REQD
HOSE NUMBER:	1 & 36	2 & 35	3 & 34	4 & 33	5 & 32	6 & 31	7 & 30	8 & 29	9 & 28	10 & 27	11 & 26	12 & 25	13 & 24	14 & 23	15 & 22	16 & 21	17 & 20	18 & 19	475 FEET



DWG. NO. 3629

JM-22-0000365

4831 30 FOOT 24 ROW 15 INCH SPACING													TOTAL HOSE LENGTH REQ'D
SERIES 4800 AIR SEEDER	220 INCHES	208 INCHES	191 INCHES	160 INCHES	185 INCHES	154 INCHES	146 INCHES	138 INCHES	129 INCHES	127 INCHES	122 INCHES	127 INCHES	329 FEET
HOSE NUMBER	1 & 24	2 & 23	3 & 22	4 & 21	5 & 20	9 & 19	7 & 18	8 & 17	9 & 16	10 & 15	11 & 14	12 & 15	



DWG. NO. 3630

JM-22-0000366

Assembly Diagrams 51

HINIKER WARRANTY

The only warranty Hiniker Company (Hiniker) gives and the only warranty the dealer is authorized to give is as follows:

We warranty products sold by Hiniker or authorized Hiniker dealers to be in accordance with our published specifications or those specifications agreed to by us in writing at time of sale. Our obligation and liability under this warranty is expressly limited to repairing or replacing, at our option, within one year after date of retail delivery, to the original purchaser, any product not meeting the specification. **WE MAKE NO OTHER WARRANTY, EXPRESS OR IMPLIED AND MAKE NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR ANY PARTICULAR PURPOSE.** Our obligation under this warranty shall not include any transportation charges or costs or any liability for direct, indirect or consequential damage or delay. If requested by Hiniker Company, products or parts for which a warranty claim is made are to be returned freight prepaid to our factory. Any improper use, operation beyond rated capacity, substitution of parts not approved by Hiniker Company, or any alteration or repair by others in such manner as in our judgment affects the product materially and adversely shall void this warranty. **NO EMPLOYEE OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY IN ANY WAY OR GRANT ANY OTHER WARRANTY.**

HINIKER reserves the right to make improvement changes on any of our products without notice.

HINIKER down not warrant the following:

1. Used products.
2. Any product that has been repaired, modified or altered in a way not approved by Hiniker Company.
3. Depreciation or damaged caused by normal wear, lack of reasonable and proper maintenance, failure to follow Operator Manual instructions, misuse, lack of proper protection during storage, or accident.
4. Parts replacement and service necessitated by normal wear or maintenance.

A DELIVERY REPORT FORM must be filled out and received by HINIKER COMPANY to initiate the warranty coverage.

HINIKER COMPANY
AIRPORT ROAD
P. O. BOX 3407
MANKATO, MN 56002-3407
PHONE (507) 625-6621
FAX (507) 625-5883

HINIKER

MODELS 4831, 4832, & 4833
AIR SEEDER CART WITH
4800 AIR SEEDER
FRONT FOLDING TOOLBAR
S/N - 102

ASSEMBLY MANUAL

DO NOT USE OR OPERATE THIS EQUIPMENT UNTIL THIS MANUAL HAS BEEN READ AND THOROUGHLY UNDERSTOOD

PART NUMBER 8054785

JM-22-0000368

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SAFETY

THIS IS THE SAFETY ALERT SYMBOL. IT ALERTS AN OPERATOR TO INFORMATION CONCERNING PERSONAL SAFETY. ALWAYS OBSERVE AND HEED THESE SYMBOLS AND INSTRUCTIONS, OTHERWISE DEATH OR SERIOUS INJURY CAN RESULT!

Operator safety is a principle concern in equipment design and distribution. However, many accidents occur because a few seconds of thought, and a more careful approach to handling, were ignored.

ACCIDENTS CAN BE AVOIDED BY KNOWING, AND FOLLOWING, THE PRECAUTIONS CITED IN THIS MANUAL.

For better viewing, certain photos may show a safety shield open or removed. This equipment should never be operated without factory installed shields in place.

Replace any decals that are not readable, or missing. Their ordering numbers and proper location are shown in the DECAL LOCATION section of the operators manual. Keep decals free of dirt, grease, etc.

Throughout this manual, and on all safety related decals, a safety alert symbol along with the signal word **CAUTION, WARNING, or DANGER** will be found. These are defined as follows:

CAUTION: A REMINDER FOR PROPER SAFETY PRACTICES AND DIRECTS ATTENTION TO FOLLOWING THEM. DECALS OF THIS CLASS ARE YELLOW AND BLACK.

WARNING: A REMINDER FOR PROPER SAFETY PRACTICES AND WHAT CAN HAPPEN IF THEY ARE IGNORED. THIS HAS A MORE SERIOUS CONSEQUENCE THAN CAUTION. DECALS OF THIS CLASS ARE ORANGE AND BLACK.

DANGER: DENOTES A MOST SERIOUS SAFETY HAZARD. IT IS A REMINDER FOR OBSERVING THE STATED PRECAUTIONS AND WHAT CAN HAPPEN IF THEY ARE IGNORED. DECALS OF THIS CLASS ARE RED AND WHITE.

There are other decals and copy in this manual that pertain to protecting the equipment. They are not directly related to operator safety. These have black letters on a white background to distinguish them from safety decals. They lack the safety alert symbol, but carry the words NOTICE or **IMPORTANT** defined as follows:

IMPORTANT: Warns the reader of potentially more serious machine damage, or poor performance if ignored.

NOTICE: INFORMS THE READER OF SOMETHING THAT CAN CAUSE MINOR MACHINE DAMAGE, OR POOR PERFORMANCE IF IGNORED.

GENERAL

1. Additional copies of this manual are available from your HINIKER dealer. If you sell this equipment, ensure that the new owner acknowledges receipt of the operators manual.

2. Read this manual thoroughly. Make sure the operator understands it and knows how to assemble and operate this equip-

ment safely. Farm equipment can kill or injure an untrained, or careless operator.

3. Do not attempt to handle and service this equipment, or direct others to do the same, unless you know how to do it safely.

4. Keep all shields and guards in place.

5. Keep hands, feet, hair and clothing away from moving parts.

6. STOP tractor engine, set brakes and wait for all motion to stop before adjusting, or servicing this equipment.

7. Keep off, keep others off, and ensure everyone is clear before starting, actuating hydraulics, and during equipment operation.

8. Do not service or otherwise handle a 4800 Air Seeder in a raised position unless it is securely blocked against falling.

9. Escaping hydraulic/diesel fluid under pressure can penetrate the skin causing serious injury.

   - DO NOT use your hand to check for leaks. Use a piece of cardboard.
   - Stop tractor and relieve pressure before connecting/disconnecting lines.
   - Tighten all connections before pressurizing hydraulic lines.
   - If fluid is injected into the skin, get medical attention immediately to prevent serious infection.

10. Discipline yourself to always visually inspect this equipment for any excessively worn, damaged, or cracked parts before starting use. Replace these with genuine HINIKER parts.

11. OSHA requires farm employers to meet certain safety standards. Become familiar with, and comply with them.

12. Watch where you are going. Note all hazards and obstructions such as ditches, overhead electrical wires, narrow gates, etc. When transporting and/or operating the machine, Refer to page 52 of the operators manual for transport height and width specifications.

13. Reduce tractor speed when transporting over uneven or rough terrain.

14. When transporting down steep hills or slopes, shift tractor into lower gear.

15. Do not alter this equipment to the extent of compromising safety and performance.

16. Do not substantially operate tractor in a closed building.

17. Agricultural chemicals can be dangerous. Always follow the manufacturer's label safety precautions when using them.

18. Do not assume everyone is as safety conscious as yourself.

BEFORE OPERATION

1. NEVER allow improperly supervised minors, or anyone else, to operate this equipment. It is your responsibility to ensure that any operator is mentally and physically capable of doing so.

2. Do not "jump start" the tractor from along side it. Start tractor only from seat.

3. Never operate wing lift cylinders on folding models without (4) restrictor fittings, one at each end of lift cylinders.

DURING OPERATION

1. Stop tractor engine, remove key and allow EQUIPMENT TO COME TO A COMPLETE STOP before:

   - Cleaning, unclogging, lubricating, inspecting, or otherwise servicing, any part of this equipment.
   - Connecting or disconnecting the cultivator from the tractor.
   - Allowing anyone else near the equipment.
   - Dismounting from the tractor seat and parking the equipment.

2. Never operate 4800 Air Seeder without having safety chain properly in place between tractor and trailer.

3. Never ride or permit others to ride on tractor drawbar or on machine; nor allow anyone other than yourself on the tractor while in operation.

4. Check all controls and operating functions of the machine in a safe area before starting to work.

5. Never fold toolbar wings forward when others are standing on the trailer or catwalk.

6. Before disconnecting lines, be sure to relieve all pressures to the system.

TOWING

1. When towing on public highways:

   - Use a tractor of sufficient size, and weight, required for field operation.

   - Do not transport faster than 25 MPH (40 kph).

2. Keep away from overhead power lines. Serious injury or death may result. Know transport height and width of your machine.

3. Always fold wings fully and close transport lock-up valve.

4. Latch tractor brakes together.

5. Shift the tractor into a lower gear when transporting down steep slopes or hills. Stop slowly.

6. Keep the SMV emblem and reflectors clean and visible from the rear.

7. Make sure the amber reflectors are clean and visible from the front.

8. Use headlights, flashing warning lights and turn signals day and night. Follow local regulations for equipment lighting and marking. Keep lighting and markings visible and in good working order.

SERVICE

1. Service information herein is intended for dealers and others correspondingly competent. If you are not experienced and/or capable of handling such service, do not attempt it.

2. Stop tractor engine, remove key and allow EQUIPMENT TO COME TO A COMPLETE STOP before:

   - Cleaning, unclogging, lubricating, inspecting, or otherwise servicing, any part of this equipment.

   - Connecting or disconnecting the field cultivator from the tractor.

   - Allowing anyone else near the equipment.

3. Securely support any machine element that must be raised for service work.

4. Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any build up of grease, oil, or debris.

REMEMBER-ACCIDENT PREVENTION IS PART OF YOUR JOB!

ASSEMBLY

RECOMMENDED TORQUE VALUES

The torque values given in Table 1 are valid for standard zinc coated and lubricated fasteners assembled in rigid joints.

Fasteners which are waxed or phosphate coated or cadmium coated or specially lubricated should be torqued to lubricate torque values below.

A ± 20 percent tolerance is to be used when a single value torque is specified.

All references to left and right, front and rear apply to the machine as viewed from the rear looking in the direction of travel.

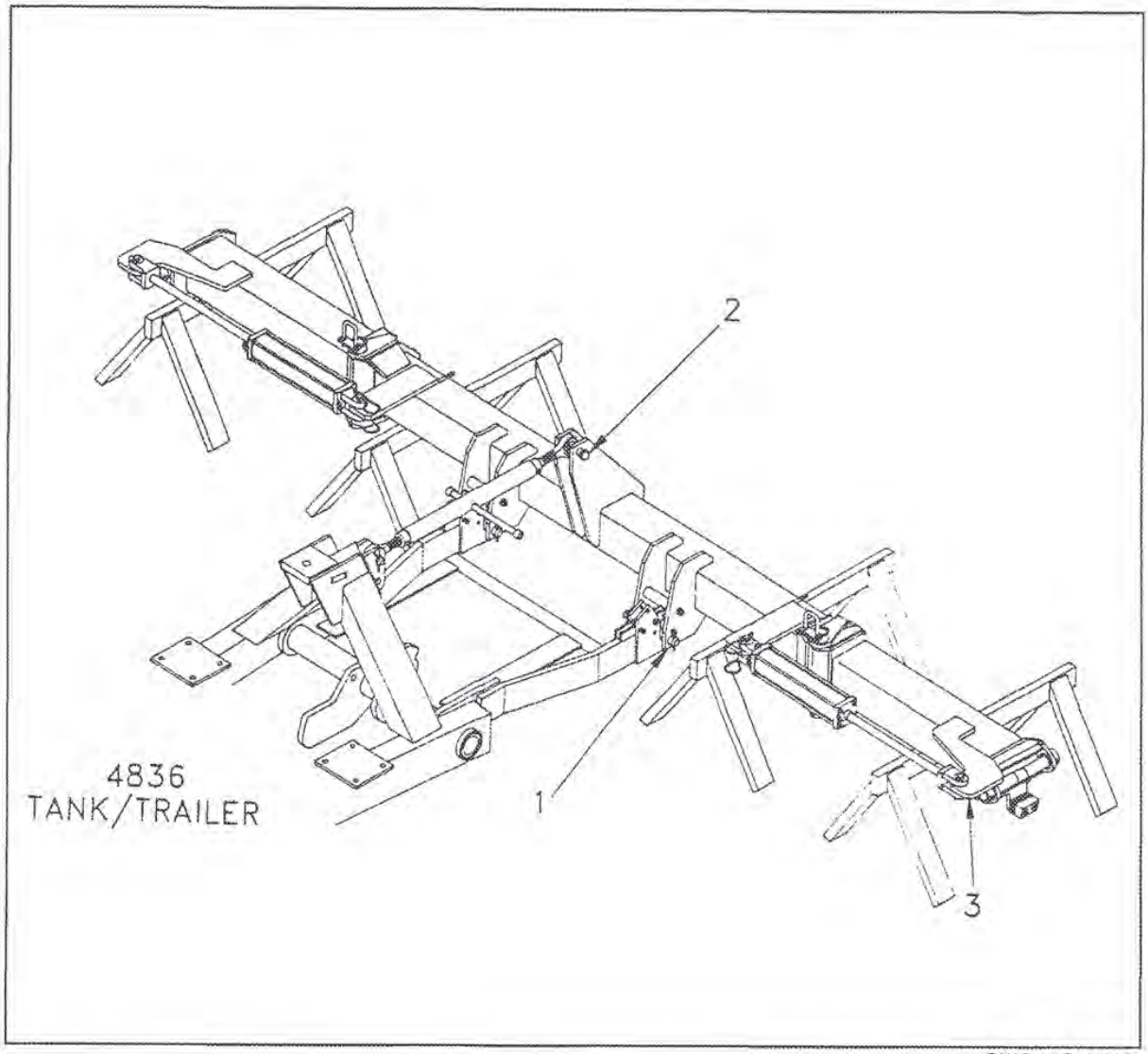
TABLE 1 - RECOMMENDED TORQUE VALUES FOR INCH FASTENERS (ZINC COATING & LUBRICATED)**

Nominal Size	SAE 2 Not Recommended For New Design lbf - ft		SAE 5 120 000 psi Min Tensile Str lbf - ft		SAE 8 150 000 psi Min Tensile Str lbf - ft	
	Dry	Lubricated	Dry	Lubricated	Dry	Lubricated
1/4-20	6	4	8	6	12	9
1/4-28	6	5	10	7	14	10
5/16-18	11	8	17	13	25	18
5/16-24	12	9	19	14	25	20
3/8-16	20	15	30	23	45	35
3/8-24	23	17	35	25	50	35
7/16-14	30	24	50	35	70	55
7/16-20	35	25	55	40	80	60
1/2-13	50	35	75	55	110	80
1/2-20	55	40	90	65	120	90
9/16-12	70	55	110	80	150	110
9/16-18	80	60	120	90	170	130
5/8-11	100	75	150	110	220	170
5/8-18	110	85	170	130	240	180
3/4-10	175	130	260	200	380	280
3/4-16	195	145	300	220	420	320
7/8-9	165	125	430	320	600	460
7/8-14	185	140	470	350	660	500
1-8	250	190	640	480	900	680
1-12	270	200	700	500	1000	740
1 1/8-7	350	270	800	600	1280	960
1 1/8-12	400	300	880	660	1440	1080
1 1/4-7	500	380	1120	840	1820	1360
1 1/4-12	550	420	1240	920	2000	1500
1 3/8-6	660	490	1460	1100	2380	1780
1 3/8-12	740	560	1680	1260	2720	2040
1 1/2-6	870	650	1940	1460	3160	2360
1 1/2-12	980	730	2200	1640	3560	2660

** MACHINE DESIGN FASTENER AND JOINT REFERENCE ISSUE.

REV. 01/2000 - #195

JM-22-0000373



DWG. NO. 3748

STEP 1

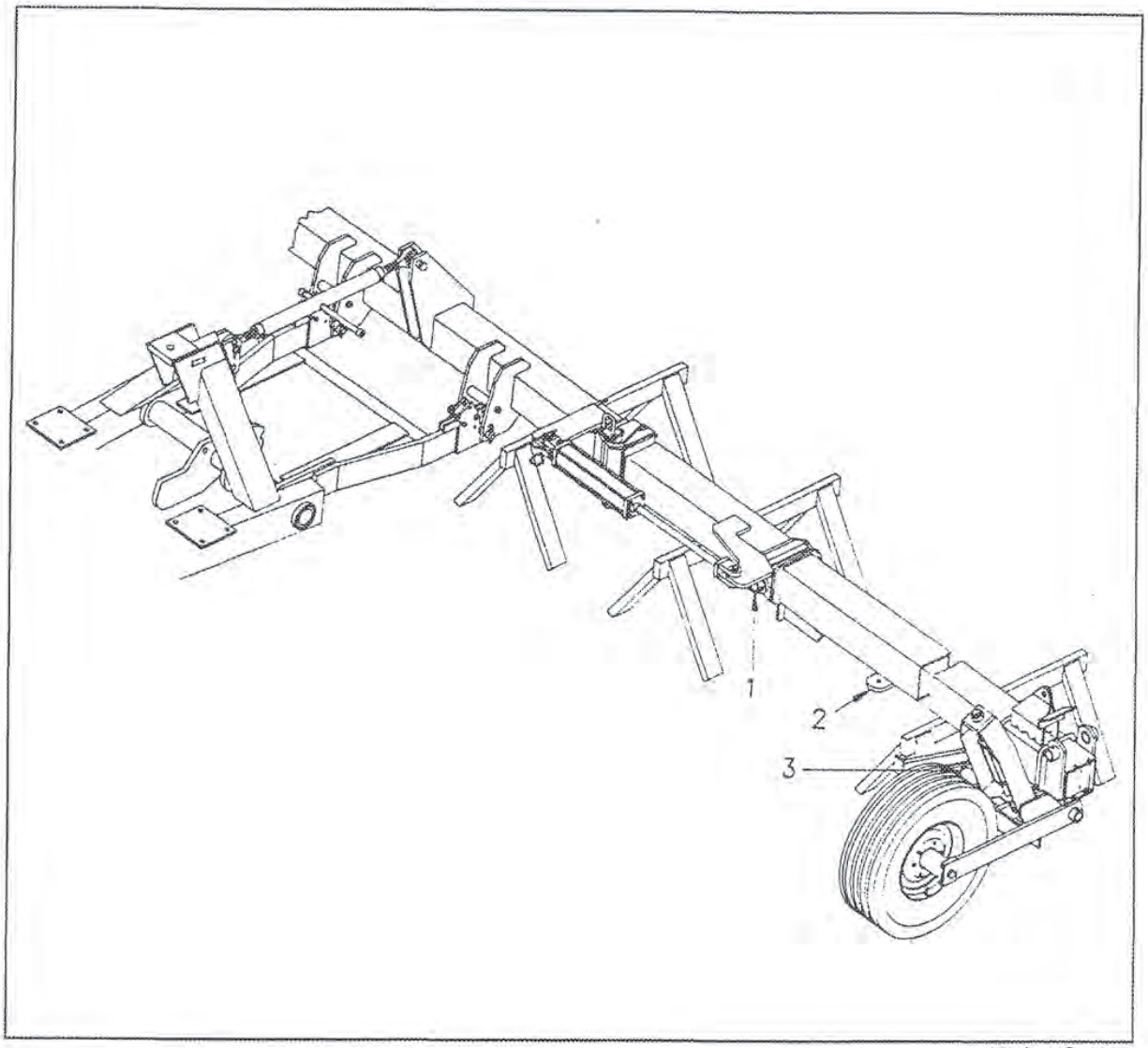
Place center toolbar on stands, holding it 19 inches off floor. Attach 3-point hitch members from 4836 tank/trailer assembly to center tooltbar hitch plate using hitch pin provided. (arrow 1 and 2).

STEP 2

Place both inner wings inline with center toolbar as shown in drawing.

STEP 3

Extend wing fold cylinder and attach to inner wing toolbar (arrow 3) using pin provided.



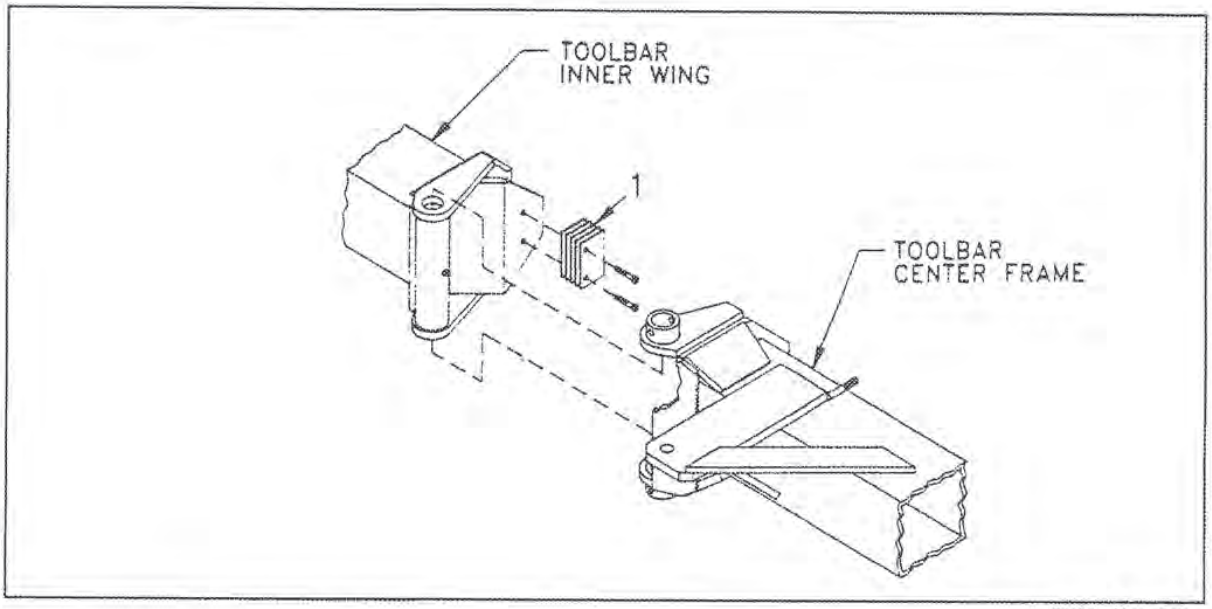
DWG. NO. 3749

STEP 4

Install both outer wings using pivot pin (arrow 1). **NOTE:** Drag link anchor (arrow 2) must be installed to front as shown in drawing.

STEP 5

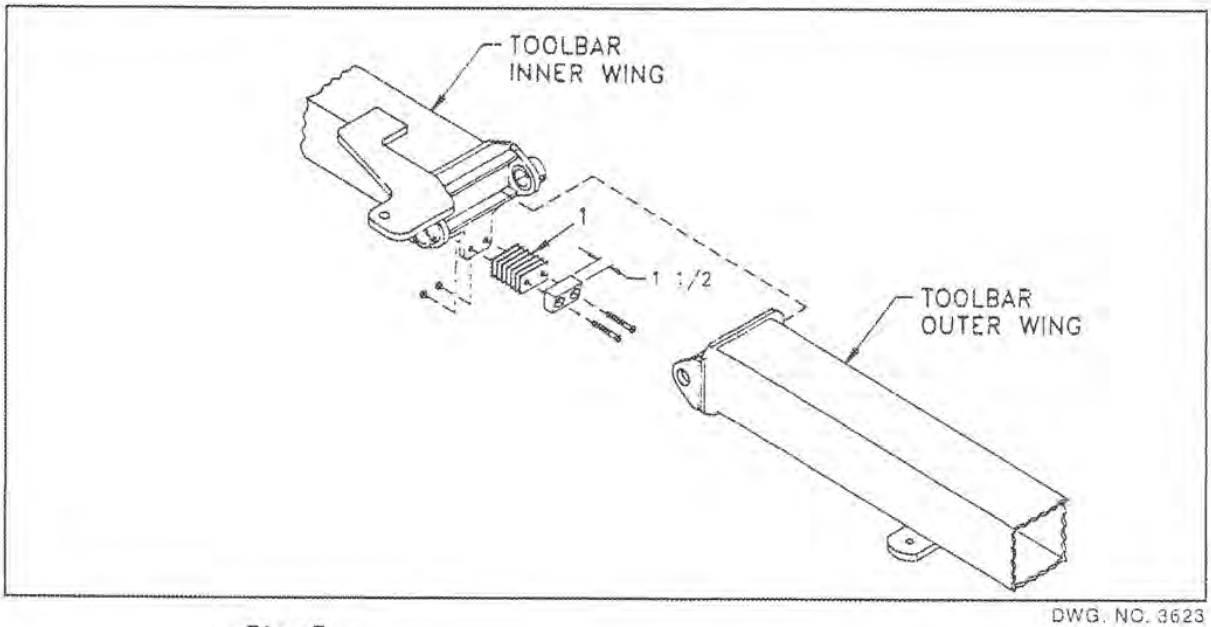
Install left and right wing wheel lift.
NOTE: The roller lock (arrow 3) must be installed on inside. Install 3/4" u-bolt (arrow 4). Use the Assembly Diagrams for proper placement of Wheel Lift & Toolbar Guide for your model size and row spacing. (Refer to pages 21-23.)



DWG. NO. 3624

STEP 6

Check for proper toolbar alignment between center frame and both inner wings. Adjust number of shims (arrow 1) as required.



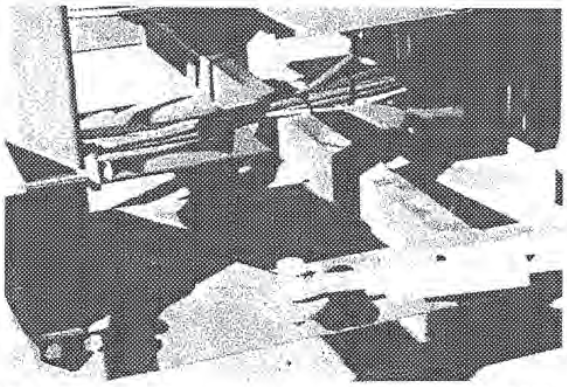
DWG. NO. 3623

Step 7

Adjust for the number of shims (arrow 1) between inner wings and outer wing.

Note: Use (4) shims for 15 inch rows and use (7) shims for 10 inch row spacing.

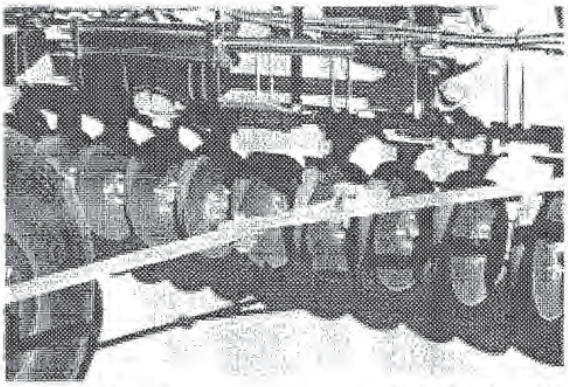
STEP 8



Left Hand Shown PHOTO NO. 4075

Install front drag link using 1 inch hex bolt provided mounting on top of trailer. Pull strap as shown. Correct drag link eyebolt dimension is 73 3/4" from center of 1" bolt through eye to center of 3/4 bolt at the pivot connection.

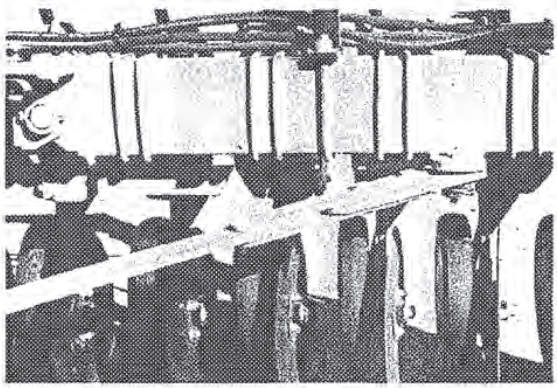
STEP 9



Left Hand Shown PHOTO NO. 4057

When installing drag link assembly the middle pivot and lock must be installed as shown, with Belleville washer on bottom and lock on top.

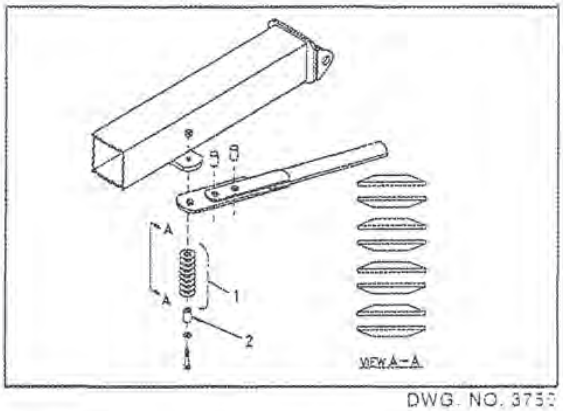
STEP 10



Right Hand Shown PHOTO NO. 4088

Install rear drag link to toolbar outer wing anchor strap as shown. **NOTE:** Position of drag link under anchor strap and Belleville washer under drag link.

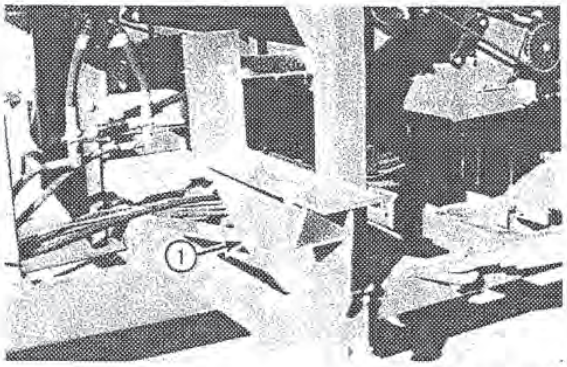
STEP 11



DWG. NO. 3750

When installing Belleville washer (arrow 1). **NOTE:** Position of washers to have the beveled sides together as shown in enlarged view. Also, tighten bolt down on spacer (arrow 2). At that point, the Belleville washer will be at proper tension.

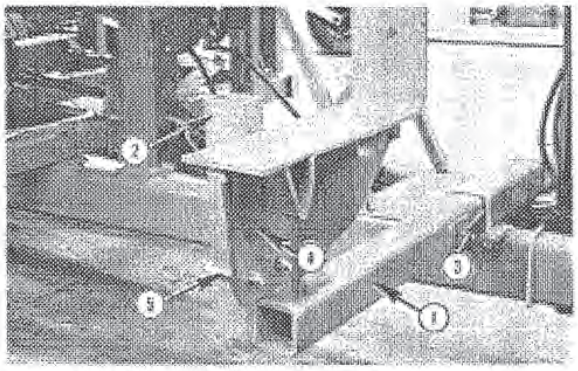
STEP 12A
(30 Ft. Toolbar)



Left Hand Shown PHOTO NO. 4051

Reinstall right and left hand wing rest (arrow 1) mounted to the front tank posts using existing 5/8 u-bolts, lockwashers and hex nuts.

STEP 12B
(40 Ft. Toolbar)



Right Hand Shown PHOTO NO. 3943A

Install front cross tube weld (arrow 1), center it on trailer tongue. **NOTE:** Position of vertical 3 x 4 tube (arrow 2) mounts to the rear. Install (2) 5/8 bolts (arrow 3) using lockwasher and hex nuts. Reinstall right and left hand wing rest (arrow 4) to the front cross tube, using original (2) 5/8 u-bolt (arrow 5) with lockwashers and hex nuts.

STEP 13

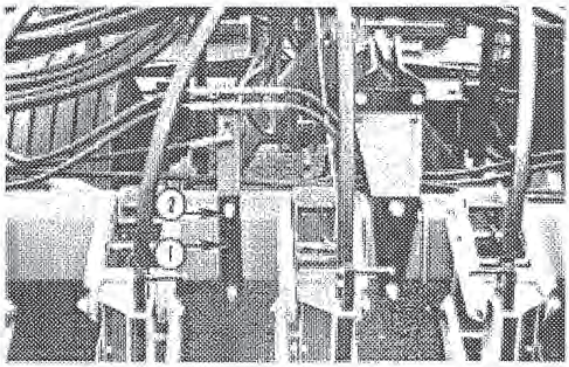
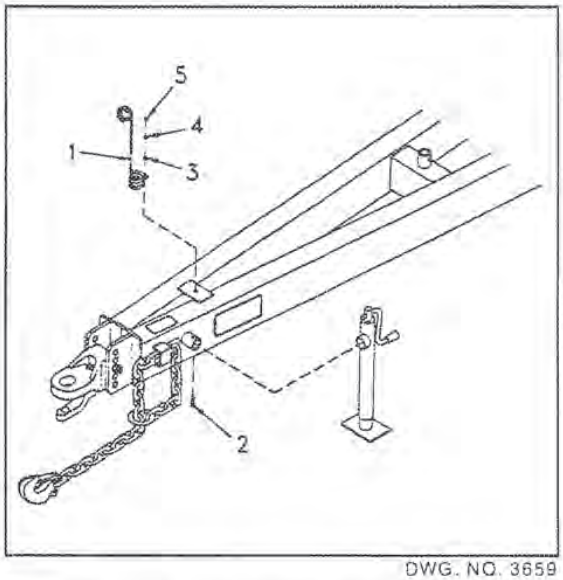


PHOTO NO. 3966

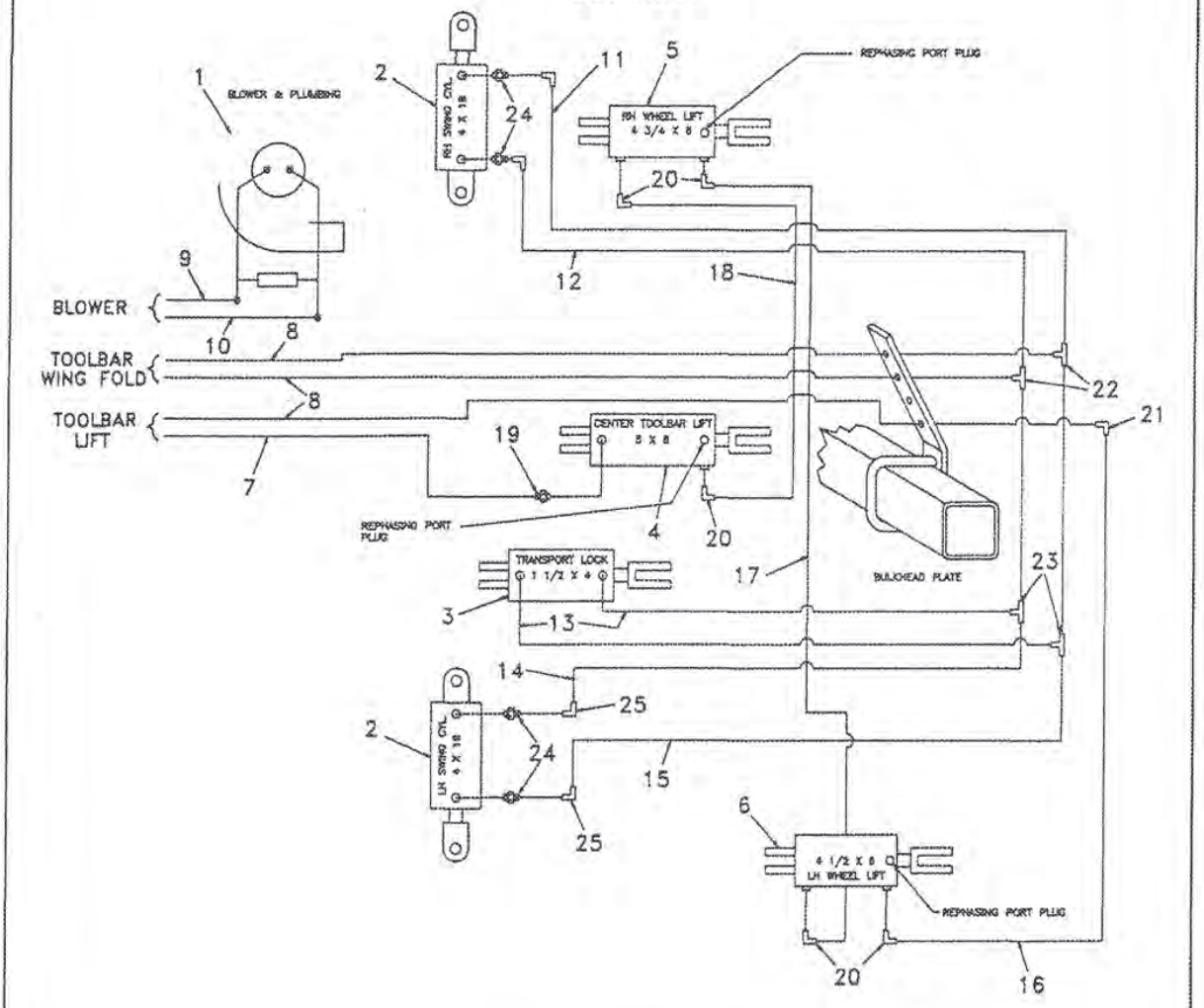
Install bulkhead plate (arrow 1) using 5/8 u-bolt (arrow 2) with lockwasher and hex nuts. **NOTE:** Bulkhead plate mounts left of center and between two 4800 disc opener units.



DWG. NO. 3659

Reinstall front hose stand (arrow 1), from cat walk step. Using (1) 1/2 x 1 1/2 hex bolt (arrow 2) with 1/2 flatwasher (arrow 3), 1/2 lockwasher (arrow 4) and 1/2 hex nut (arrow 5).

HYDRAULIC PLUMBING DIAGRAM



DWG. NO. 3751

REF. NO.	PART NUMBER	DESCRIPTION	QTY	REF. NO.	PART NUMBER	DESCRIPTION	QTY
1	80305265	Blower & Plumbing Assembly	1	16	957-001-034	Hose Assy 3/8 x 180" 30° Toolbar	1
2	81004342	4 x 16 Cylinder Assembly	2		957-001-074	Hose Assy 3/8 x 240" 40° Toolbar	1
3	624001	HYD Cylinder 1 1/2 x 4	1	17	957-001-072	Hose Assy 3/8 x 378" 30° Toolbar	1
4	80305383	5 x 8 Cylinder	1		957-001-076	Hose Assy 3/8 x 498" 40° Tooolbar	1
5	80305385	4 3/4 x 8 Cylinder	1	18	957-001-073	Hose Assy 3/8 x 288" 30° Toolbar	1
6	80305384	4 1/2 x 8 Cylinder	1		957-001-075	Hose Assy 3/8 x 348" 40° Toolbar	1
7	957-004-015	Hose Assy 3/8 x 264"	1	19	956-003-001	STR-ADPT 9/16 MJIC x 3/4 MORB w/o Restrictor	1
8	957-004-014	Hose Assy 3/8 x 318"	3				
9	957-009-011	Hose Assy 1/2 x 200"	1	20	956-005-001-	Fitting-Elbow 90° 9/16 MJIC x 3/4 MORB	5
10	957-009-010	Hose Assy 1/2 x 210"	1	21	956-006-002	Fitting-Bulkhead Elbow 90° 9/16 MJIC x 9/16 MJIC	1
11	957-001-018	Hose Assy 3/8 x 79"	1	22	956-007-003	Fitting-Bulkhead Tee 9/16 MJIC x 9/16 MJIC x 9/16 MJIC	2
12	957-001-013	Hose Assy 3/8 x 59"	1				
13	957-002-020	Hose Assy 3/8 x 66"	2	23	956-007-010	Fitting Tee 9/16 FJIC x 9/16 MJIC x 9/16 MJIC	2
14	957-001-071	Hose Assy 3/8 x 36"	1				
15	957-001-061	Hose Assy 3/8 x 56"	1	24	956-008-024	Restrictor Fitting 3/4 MORB x 9/16 MJIC	4
				25	956-005-002	Fitting-Elbow 90° 9/16 MJIC x 9/16 FJIC	4

JM-22-0000379

STEP 14

HYDRAULIC SYSTEM INSTALLATION

WARNING: TO PREVENT PERSONAL INJURY OR DEATH. ESCAPING HYDRAULIC/DIESEL FLUID UNDER PRESSURE CAN PENETRATE THE SKIN CAUSING SERIOUS INJURY.

- **DO NOT use your hand to check for leaks. Use a piece of cardboard.**
- **Stop tractor and relieve pressure before connecting/disconnecting lines.**
- **Tighten all connections before pressurizing hydraulic lines.**
- **If fluid is injected into the skin, get medical attention immediately to prevent serious infections.**

IMPORTANT: Cleanliness is very important when working in the hydraulic system. Prevent contamination by assembling the cylinders, hoses, couplers and valves in a clean area of the shop.

Leave protective caps on the fluid openings until ready to make the connection. When charging the system, use a tractor or other source that contains clean oil, free of abrasive materials. Keep couplers clean. abrasive particles, like sand or metal fragments, can damage seals, barrels and pistons, causing internal leakage.

Refer to illustration on page 13 for proper assembly and installation of hydraulic lines and fittings.

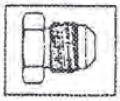
Refer to pages 14-16 for proper assembly and installation of optional hydraulic row markers and fill augers.

NOTE: Thread sealant is to be used on the pipe threads going into the male hydraulic tips that connect to the tractor. The thread sealant must be compatible with the hydraulic systems.

Secure all hydraulic connections in accordance with hydraulic fitting installation procedures and the torque table.

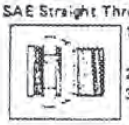
HYDRAULIC FITTING INSTALLATION PROCEDURES AND TORQUE TABLE

SAE Flare Connection



1) Tighten nut finger tight until it bottoms the seat.
2) Using a wrench, rotate nut to tighten. Turn nut 1/3 turn to apply proper torque.

SAE Straight Thread "O" Ring Seal

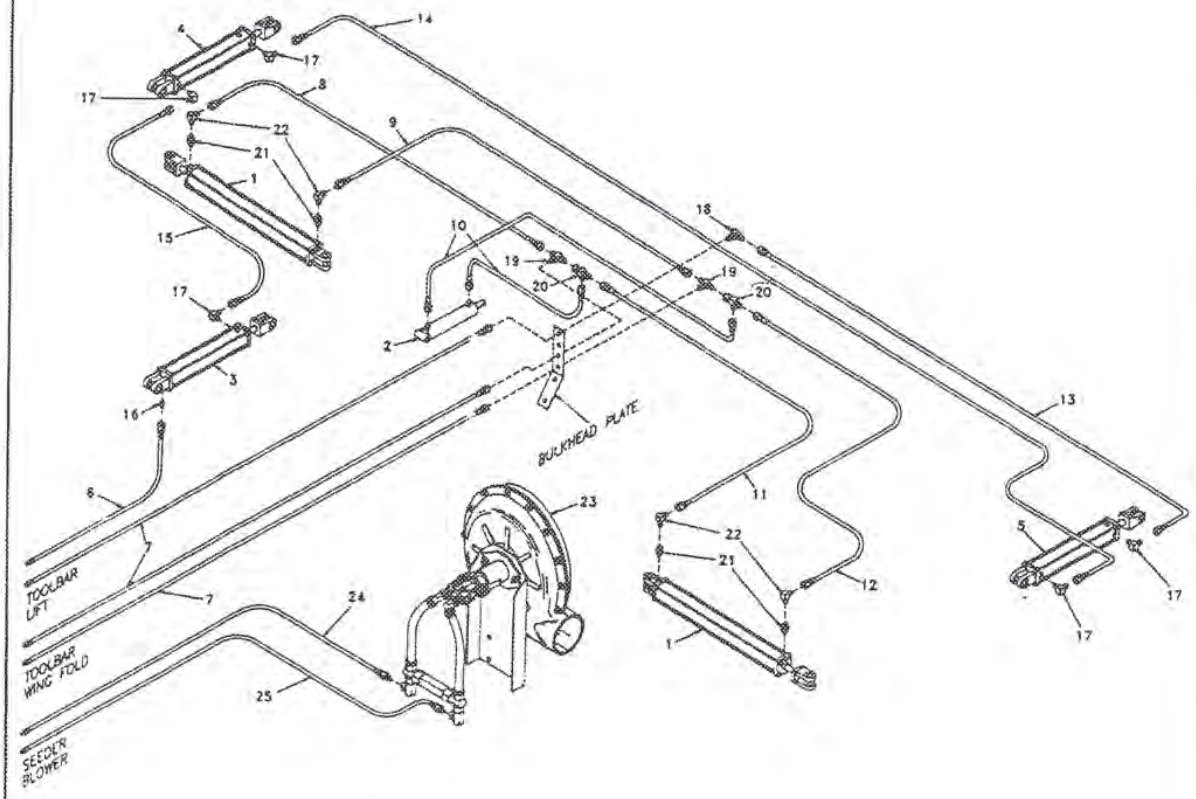


1) Insure jam nut and washer are backed up to the back side of smooth portion of elbow adapter.
2) Lubricate "O" Ring-VERY IMPORTANT!
3) Thread into port until washer bottoms onto spot face.
4) Position elbows by backing up adapter.
5) Tighten jam nut.

DWG. NO. 1966

Hiniker does not supply quick connect hydraulic couplings with the 4836 Air Seeder. Use couplers that match the customer's tractor outlets. ISO quick connect couplers are the most common style.

HYDRAULIC HOSE ASSEMBLY

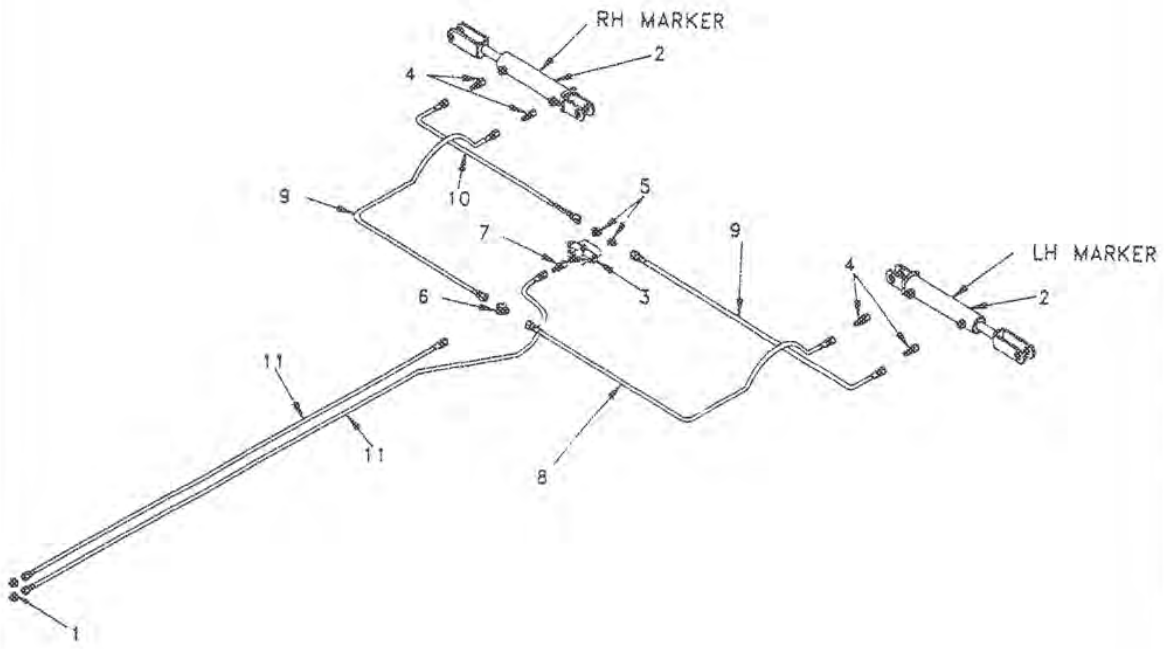


DWG. NO. 3653A

REF. NO.	PART NUMBER	DESCRIPTION	QTY.	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	81004342	4 x 16 Cylinder Assy	2	15	957-001-073	Hose Assy 3/8 x 288" 30' Toolbar	1
2	624001	1 1/2 x 4 HYD Cylinder	1		957-001-075	Hose Assy 3/8 x 348" 40' Toolbar	1
3	80305383	5 x 8 Cylinder	1	16	956-003-001	STR-ADPT 9/16 MJIC x 3/4 MORB w/o Restictor	1
4	80305385	4 3/4 x 8 Cylinder	1				
5	80305384	4 1/2 x 8 Cylinder	1	17	956-005-001	Fitting Elbow 90° 9/16 MJIC x 3/4 MORB	5
6	957-004-015	Hose Assy 3/8 x 264"	1	18	956-006-002	Fitting-Bulkhead Elbow 90° 9/16 MJIC x 9/16 MJIC	1
7	957-004-014	Hose Assy 3/8 x 318"	3				
8	957-001-018	Hose Assy 3/8 x 79"	1	19	956-007-003	Fitting-Bulkhead Tee 9/16 MJIC x 9/16 MJIC x 9/16 MJIC	2
9	957-001-013	Hose Assy 3/8 x 59"	1				
10	957-002-020	Hose Assy 3/8 x 66"	2	20	956-007-010	Fitting Tee 9/16 FJIC x 9/16 MJIC x 9/16 MJIC	2
11	957-001-071	Hose Assy 3/8 x 36"	1	21	956-008-024	Restrictor Fitting 3/4 MORB x 9/16 MJIC	4
12	957-001-061	Hose Assy 3/8 x 56"	1	22	956-005-002	Fitting-Elbow 90° 9/16 MJIC x 9/16 FJIC	4
13	957-001-034	Hose Assy 3/8 x 180" 30' Toolbar	1	23	80305265	Blower & Mount Assy	1
	957-001-074	Hose Assy 3/8 x 240" 40' Toolbar	1	24	957-009-011	Hose Assy 1/2 x 200"	1
14	957-001-072	Hose Assy 3/8 x 378" 30' Toolbar	1	25	957-009-010	Hose Assy 1/2 x 210"	1
	957-001-076	Hose Assy 3/8 x 498" 40' Toolbar					

JM-22-0000381

OPTIONAL HYDRAULICS
MARKERS

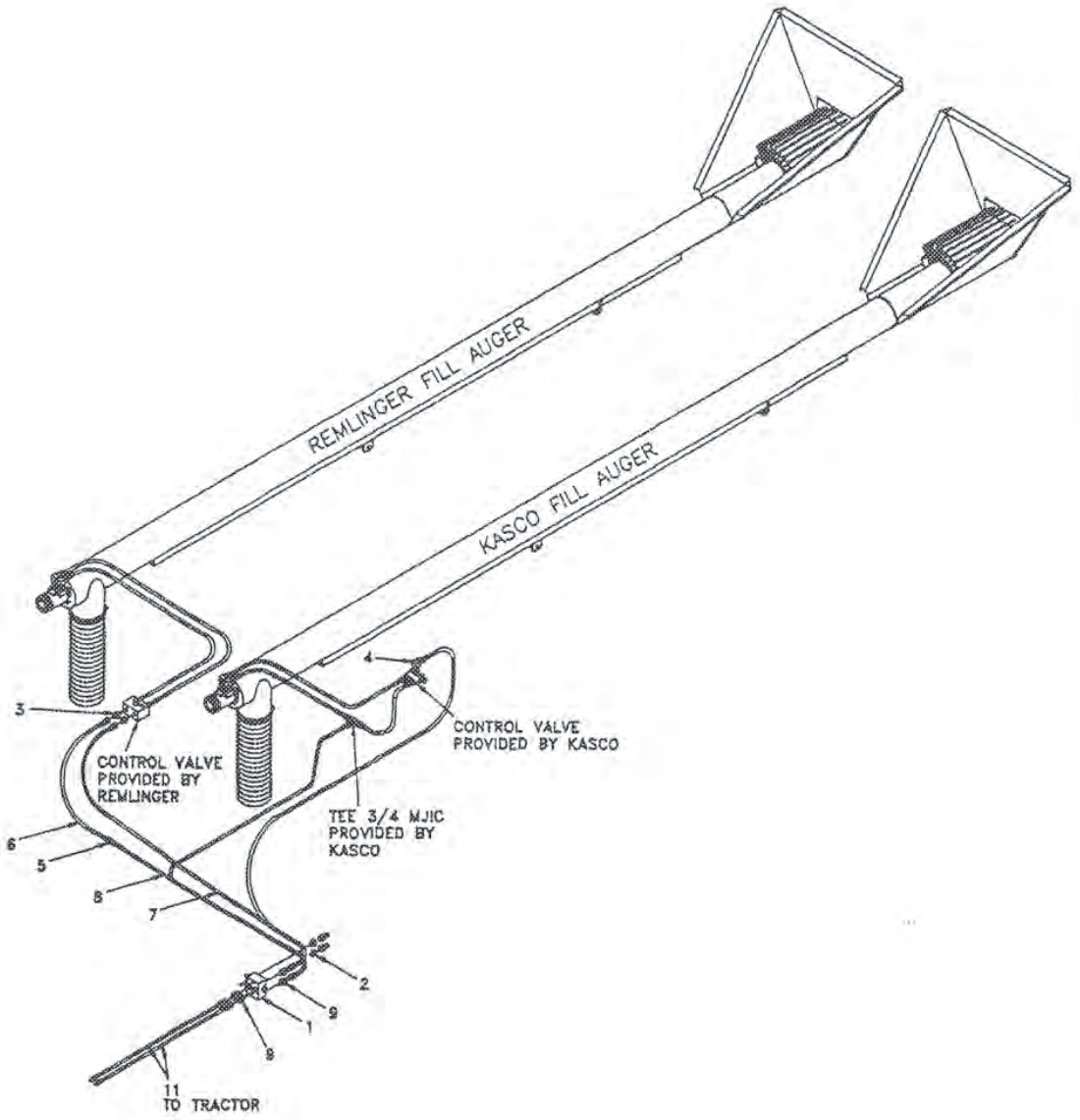


HINIKER P/N 80305585, 80305586 DWG. NO. 3777

REF. NO.	PART NUMBER	DESCRIPTION	QTY.	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	957-004-014		2	8	957-001-074	40' Hose Assy 3/8 x 240"	1
2	624129	2 1/2 x 24 CYL Assy PMC #AR-265	2		957-001-074	30' Hose Assy 3/8 x 240"	1
3	805-003-026	Sequence Valve	1	9	957-001-079	40' Hose Assy 3/8 x 260"	2
4	956-008-024	Restrictor Fitting	4		957-001-079	30' Hose Assy 3/8 x 260"	2
5	956-005-001	Fitting-Elbow 90°	2	10	957-004-080	40' Hose Assy 3/8 x 284"	1
6	956-007-003	Fitting-Tee	1		957-004-080	30' Hose Assy 3/8 x 284"	1
7	956-003-001	Fitting STR. APT. 3/4 ORB x 9/16 MJIC	1	11	957-004-014	40' Hose Assy 3/8 x 318"	2
					957-004-014	30' Hose Assy 3/8 x 318"	2

JM-22-0000382

OPTIONAL HYDRAULICS
FILL AUGERS

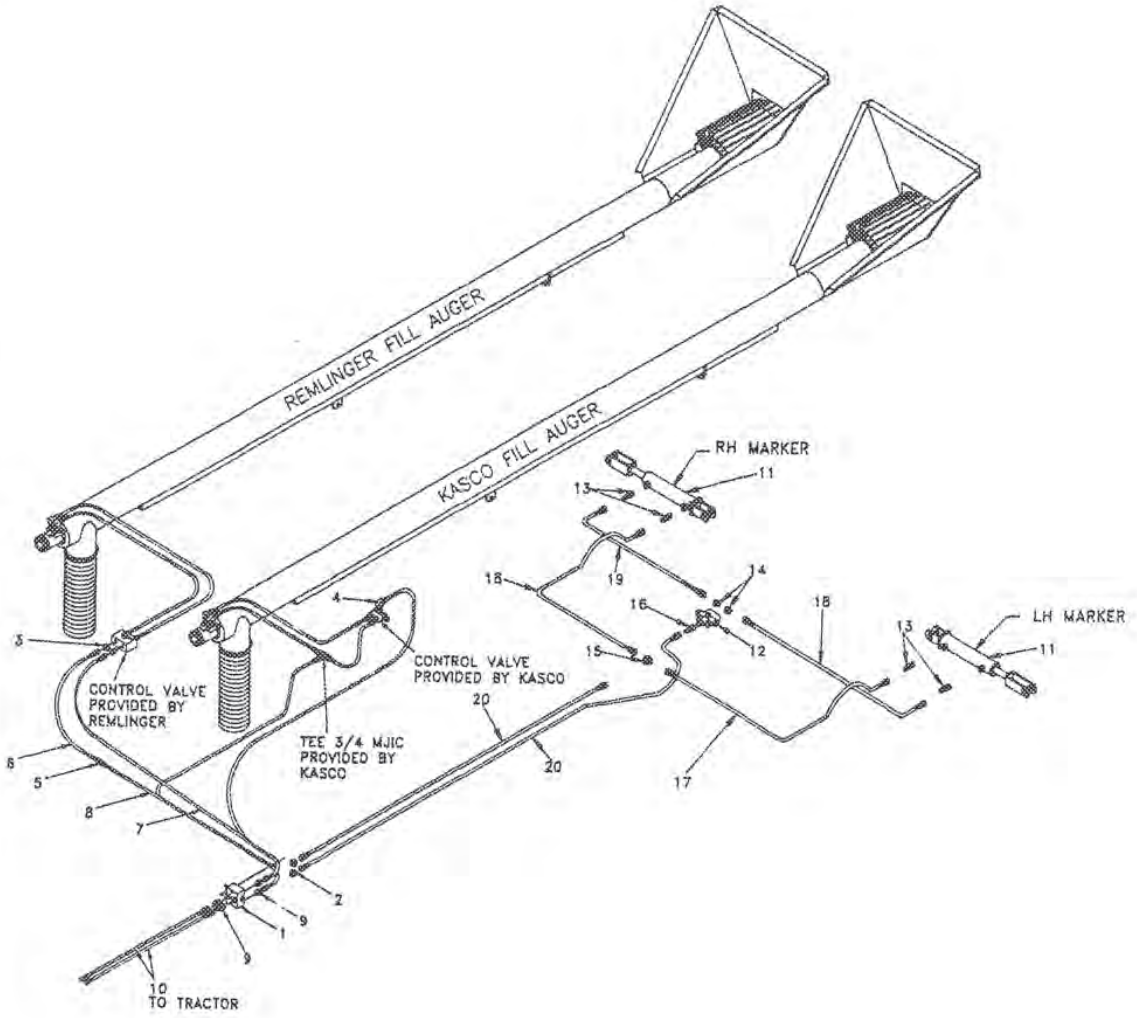


HINIKER P/N 80305509 DWG. NO. 3778

REF. NO.	PART NUMBER	DESCRIPTION	QTY.	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	80305516	HYD Valve	1	5	209-01019	Union 3/4 MJIC (2)	1
2	203-35510	O-Ring Pipe Plug	2	6	957-005-021	Hose Assy 3/8 x 50"	1
3	956-003-003	Fitting-Straight Adapter 1/2 MNPT x 9/16 MJIC	2	7	957-001-074	Hose Assy 3/8 x 240"	1
				8	957-005-003	Hose Assy 3/8 x 191"	1
4	956-005-003	Fitting-Elbow 90° 1/2 MNPT x 9/16 MJIC	1	9	956-003-001	STR-ADPT 9/16 MJIC x 3/4 MORB	2

JM-22-0000383

OPTIONAL HYDRAULICS
MARKERS & FILL AUGERS

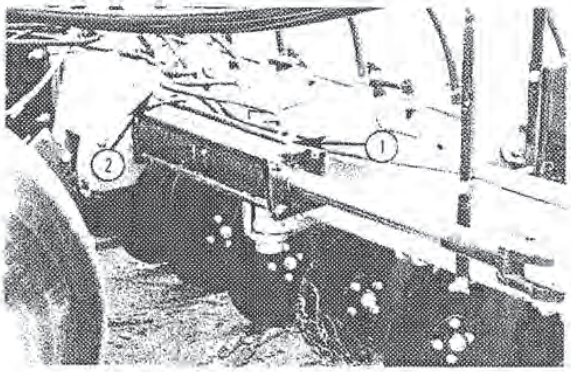


HINIKER P/N 80305509, 80305585 & 80305586 DWG. NO. 3779

REF. NO.	PART NUMBER	DESCRIPTION	QTY.	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	80305516	HYD Valve	1	12	805-003-026	Sequence Valve	1
2	203-35510	O-Ring Pipe Plug	2	13	956-008-024	Restrictor Fitting	4
3	956-003-003	Fitting-Straight Adapter 1/2 MNPT x 9/16 MJIC	2	14	956-005-001	Fitting-Elbow 90°	2
				15	956-007-003	Fitting-Tee	1
4	956-005-003	Fitting-Elbow 90° 1/2 MNPT x 9/16 MJIC	1	16	956-003-001	Fitting STR. APT. 3/4 ORB x 9/16 MJIC	1
5	209-01019	Union 3/4 MJIC (2)	1	17	957-001-074	40' Hose Assy 3/8 x 240"	1
6	957-005-021	Hose Assy 3/8 x 50"	1		957-001-074	30' Hose Assy 3/8 x 240"	1
7	957-001-074	Hose Assy 3/8 x 240"	1	18	957-001-079	40' Hose Assy 3/8 x 260"	2
8	957-005-003	Hose Assy 3/8 x 191"	1		957-001-079	30' Hose Assy 3/8 x 260"	2
9	956-003-001	STR-ADPT 9/16 MJIC x 3/4 MORB	4	19	957-004-080	40' Hose Assy 3/8 x 284"	1
10	957-004-014	Hose Assy 3/8 x 318"	2		957-004-080	30' Hose Assy 3/8 x 284"	1
11	624129	2 1/2 x 24 CYL Assy PMC #AR-265	2	20	957-004-014	40' Hose Assy 3/8 x 318"	2
			1		957-004-014	30' Hose Assy 3/8 x 318"	2

JM-22-0000384

STEP 14A



LH SHOWN PHOTO NO. 3935A

Install right and left hand toolbar fold cylinder as shown in photo. **NOTE:** Restrictor fittings (arrow 1 and 2).

STEP 14B

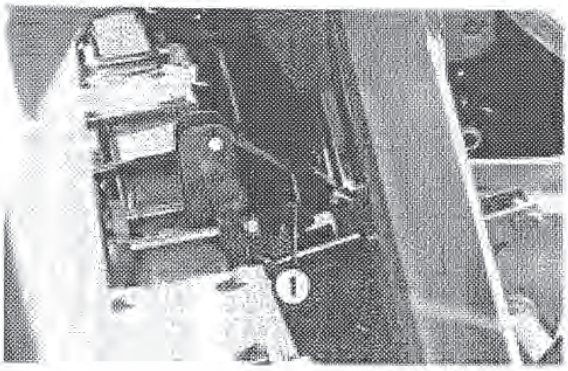


PHOTO NO. 4055

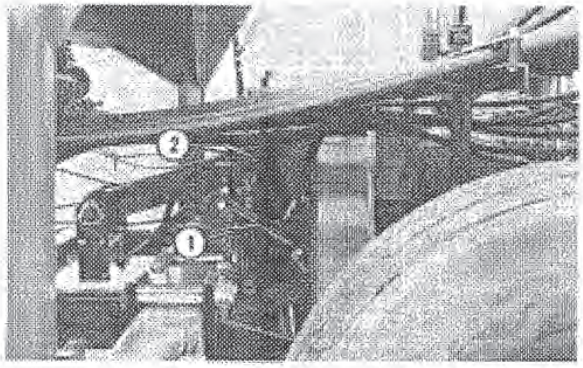
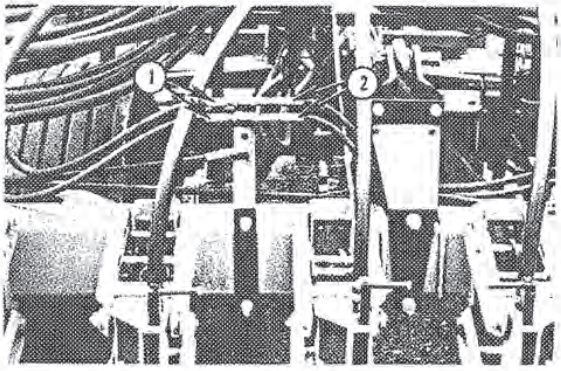


PHOTO NO. 3969

Install hydraulic hoses and fittings to transport lock cylinder (arrow 1) as shown in photo. Install hydraulic hose and fitting to center rockshaft lift cylinder (arrow 2).

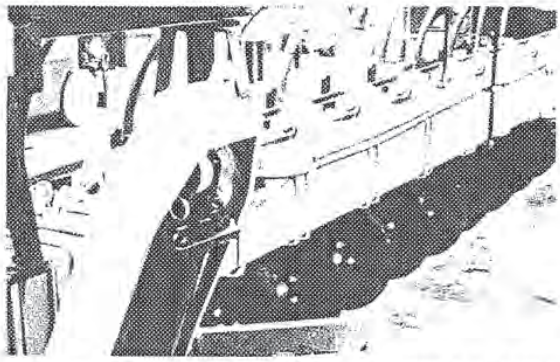
STEP 14C



TOOLBAR FOLD PLUMBING PHOTO NO. 3966A

Install (2) bulkhead tee fittings (arrow 1) into bulkhead plate. Add (2) inline tee (arrow 2) which runs to transport lock cylinder. **NOTE:** 90° bulkhead fitting is return line from left hand wheel lift cylinder.

STEP 14D



RH SHOWN PHOTO NO. 3958A

Install hydraulic hoses and fittings to right and left hand wheel lift cylinder. Route hoses through hose support (arrow 1) in photo 4059. **NOTE:** After 4800 seeder units have been installed, hydraulic hose must be tied up as shown in photo 3958A.



PHOTO NO. 4059

JM-22-0000385

STEP 14E

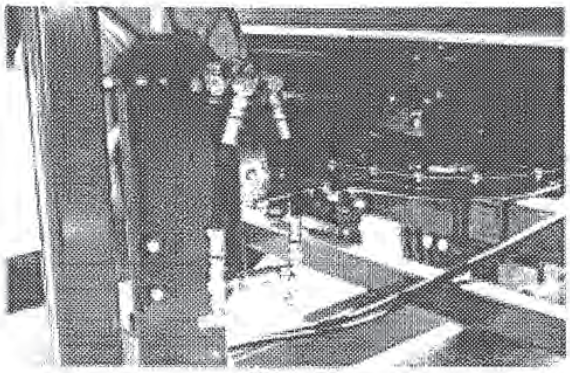
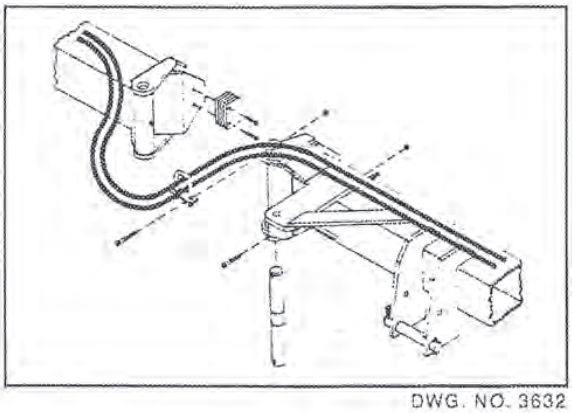


PHOTO NO. 4055A

Install hydraulic hoses to blower plumbing as shown in photo.

STEP 14F



DWG. NO. 3632

Install hydraulic hoses through pivot pin hose guide as shown in drawing.

NOTE: Optional marker hoses will also run through hose guide.

STEP 15

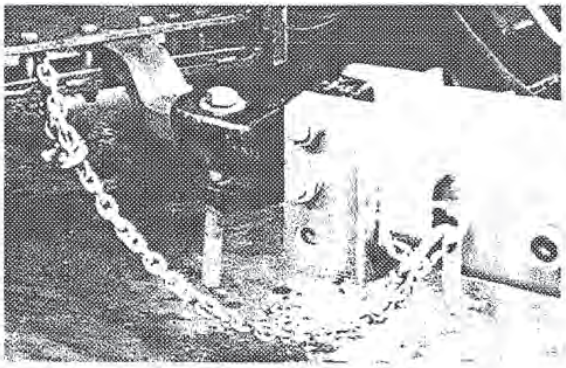


PHOTO NO. 3973

Attach 4836 tank/trailer to tractor hitch, and attach safety chain as shown in photo. Connect all hydraulic lines to tractor outlets.

STEP 16

IMPORTANT: Before operating hydraulic toolbar lift cylinders, all captive air must be removed from system. This may be done by removing cylinder pin from rod end of cylinder and cycling system until system is purged of air. Reattach cylinder rod pin and cautiously cycle toolbar lift through full cycle. Failure to take precaution may result in bodily injury or equipment damage.

Raise toolbar and remove stands from under toolbar. Raise toolbar to highest position.

STEP 17

IMPORTANT: Never operate wing fold cylinders without (4) restrictor fittings part number 956-008-024 for 4 inch cylinder, one at each end of both cylinders. Failure to have restrictors in place may result in body injury or equipment damage.

Fold toolbar forward, only half way at this time. Return toolbar to straight inline and lower toolbar to have bottom of toolbar 19 inches off the ground.

STEP 18

CAUTION: A lifting device such as crane, loader, or forklift is required for handling large parts and shipping bundles. Do not attempt to remove disc opener units from shipping bundle while in vertical position. Bundle may fall, causing severe injury or death, if not handled with proper equipment. While removing bundling straps, wires, or brackets be certain to keep clear of any parts that may drop. Support heavy sections with hoist or blocks before removing wires or straps.

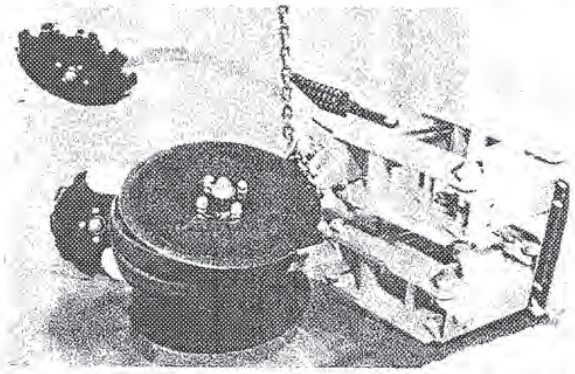


PHOTO NO. 3974A

When moving right and left hand disc opener shipping bundle, attach lift chain around rear mast shank, and between parallel link and gauge wheel, as shown in photo.

CAUTION: When removing any bundling straps, wires or brackets, be certain to keep clear of any parts which may drop. Support heavy sections with hoist or blocks before removing wires or straps.

STEP 19

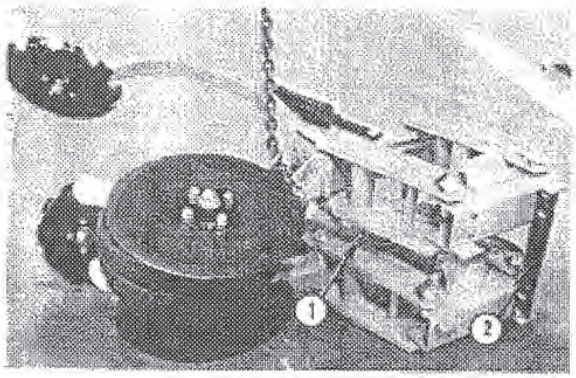


PHOTO NO. 3974

With disc opener shipping bundle laying securely on the floor as shown in photo, cut the shipping band (arrow 1) and unbolt angle strap (arrow 2). Lift top unit off and lay securely on the floor.

STEP 20

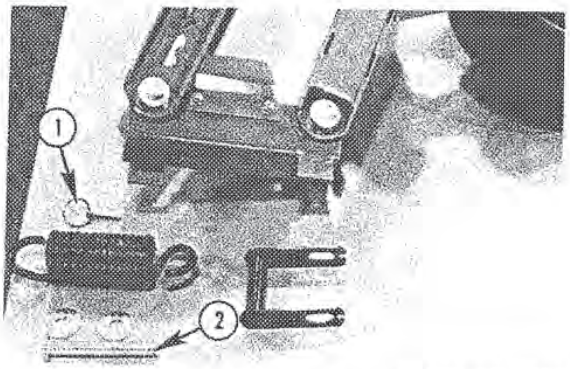
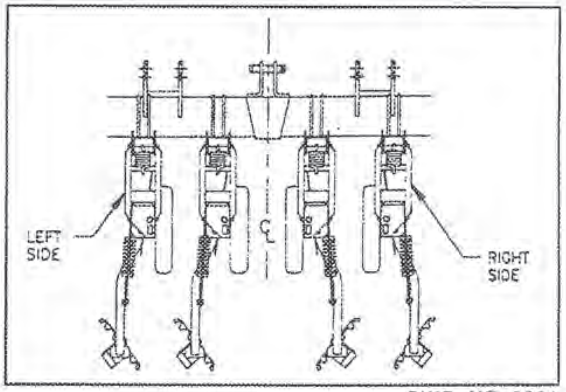


PHOTO NO. 3976

With disc opener laying on the floor, remove down pressure spring assembly. First remove klik pin (arrow 1) and 3/4" flat washer, then 3/4" pin (arrow 2). At this time the spring will be loose inside of disc opener. Set spring and handle aside at this time. It will all be reassembled later.

NOTE: All hardware should be tightened only enough to insure safety during assembly. Torque hardware to specified values, as shown on torque chart on page 5, only after assembly has been completed.

RIGHT AND LEFT SIDE
DISC OPENER IDENTIFICATION



DWG. NO. 3634

Notice gauge wheel on inside, starting at toolbar center and the rotary closer support arm offset to outside.

STEP 21

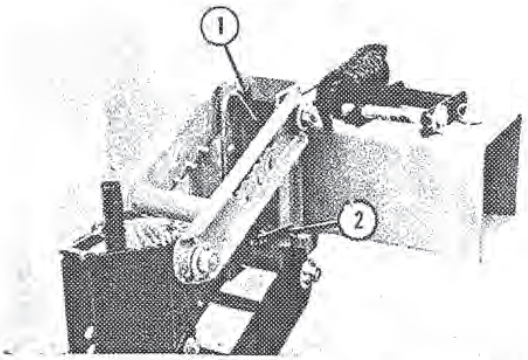


PHOTO NO. 3621A

Make sure bottom of toolbar is 19" off the ground before mounting disc opener up to the toolbar. See assembly diagrams on pages 21 to 23 for proper location of disc opener. Move disc opener up to toolbar with front mast locks engaged. Install (2) 1/2 u-bolts (arrow 1) with (4) 1/2 lockwashers and (4) 1/2 hex nuts (arrow 2).

STEP 22

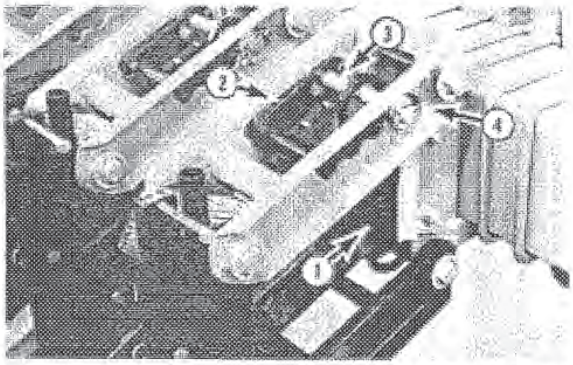


PHOTO NO. 3605A

After disc opener has been mounted up to toolbar and u-bolt and hex nuts are tight, reinstall down pressure spring (arrow 1).

NOTE: The large 1 inch hook opening is at bottom. use front 7/8 diameter rod anchor.

Reinstall adjusting handle (arrow 2) and 3/4" pin (arrow 3) with 3/4" flat washers and klik pin (arrow 4).

STEP 23

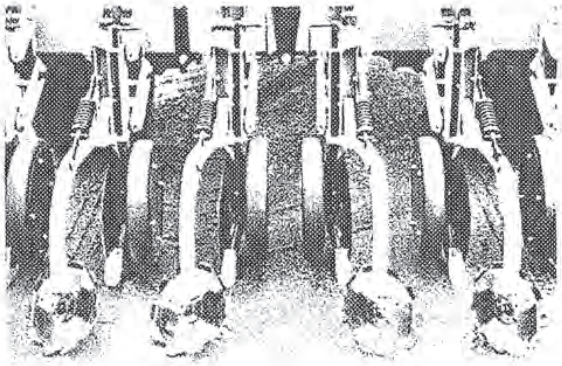


PHOTO NO. 3977

Continue to mount disc openers across the toolbar working from center out.

See Assembly Diagrams on pages 21 to 23 for proper location of disc openers.

STEP 24

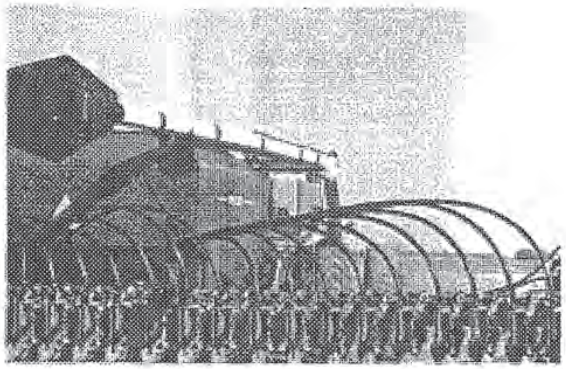


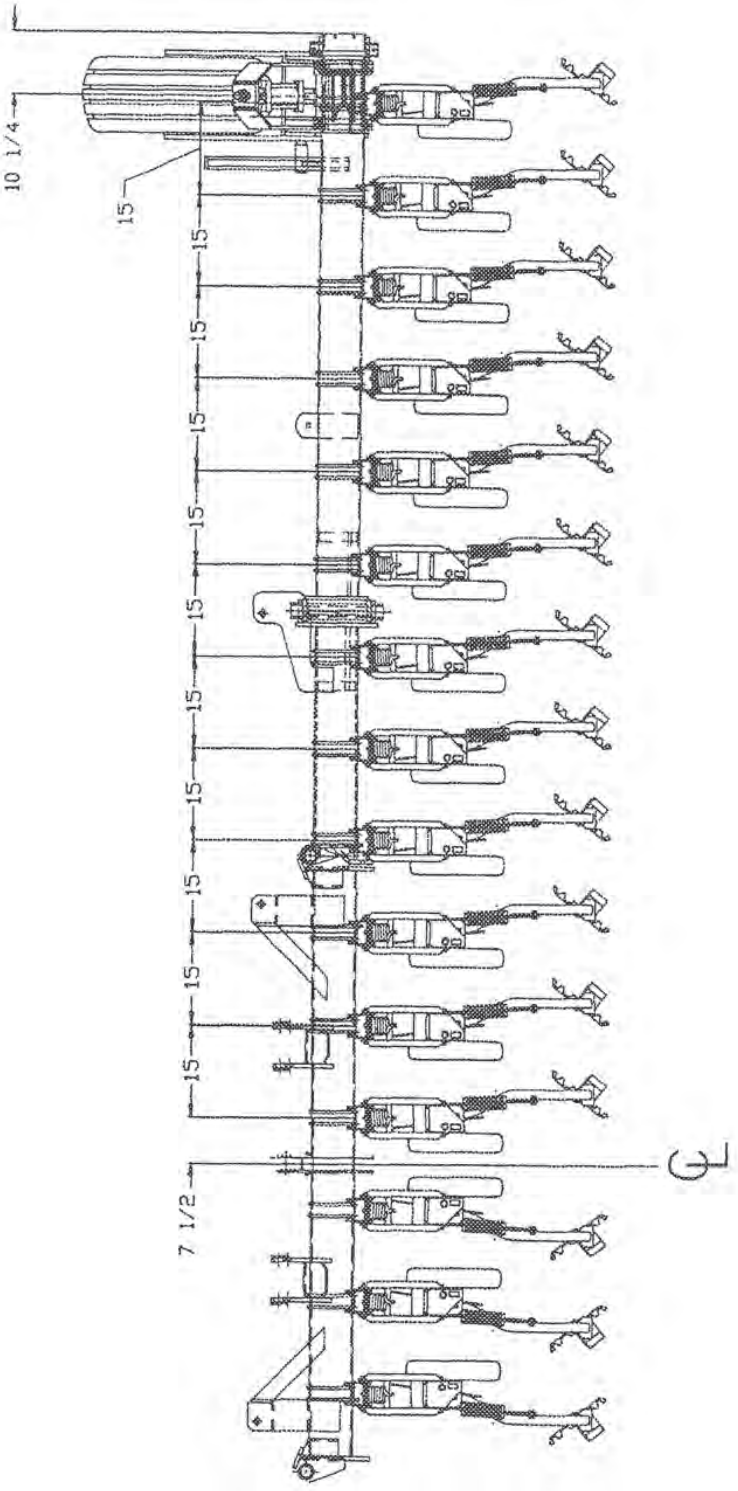
PHOTO NO. 3978

Continue to mount disc opener around hinges.

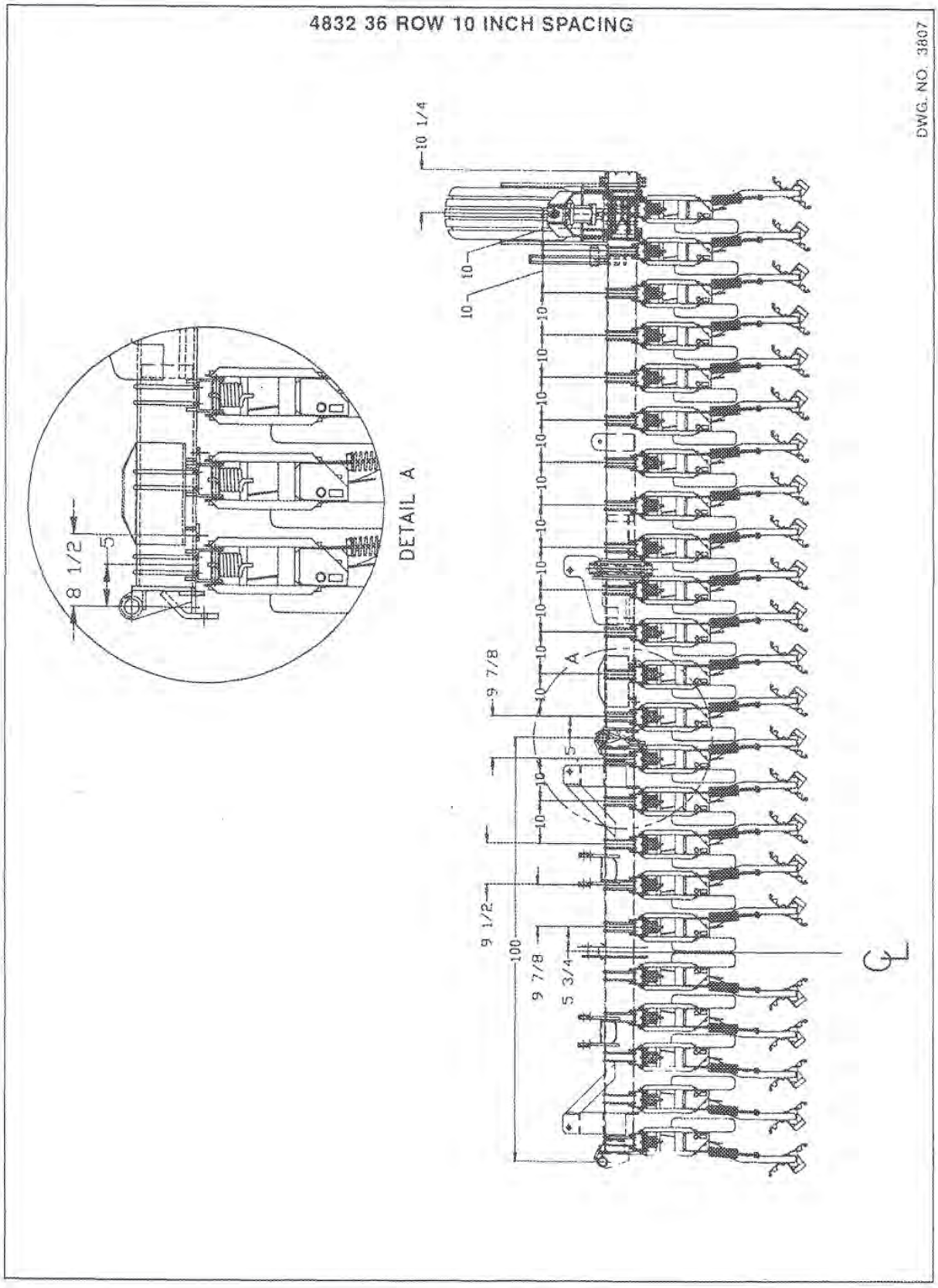
NOTE: On Model 4833 40 ft. w/15" spacing only. You must remove the bottom lock pad on the front channel weld of the row unit next to the horizontal wing hinge.

4831 24 ROW 15 INCH SPACING

DWG. NO. 3806



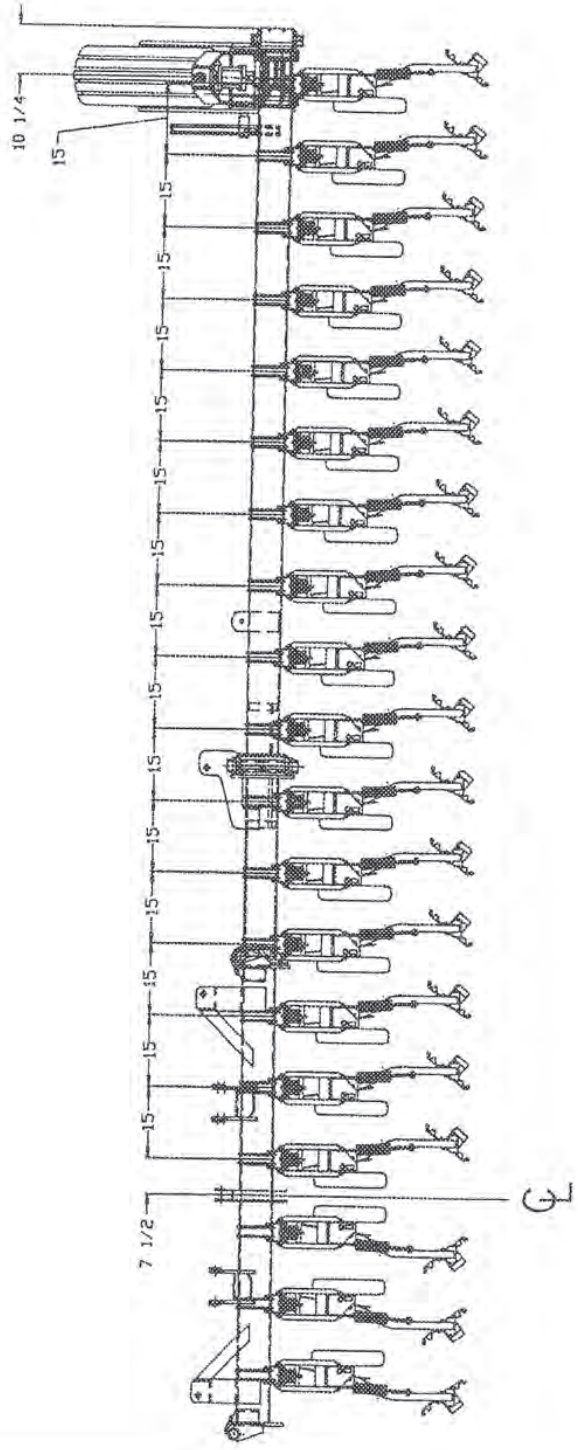
JM-22-0000389



JM-22-0000390

4833 36 R0W 15 INCH SPACING

DWG. NO. 3808



JM-22-0000391

STEP 25

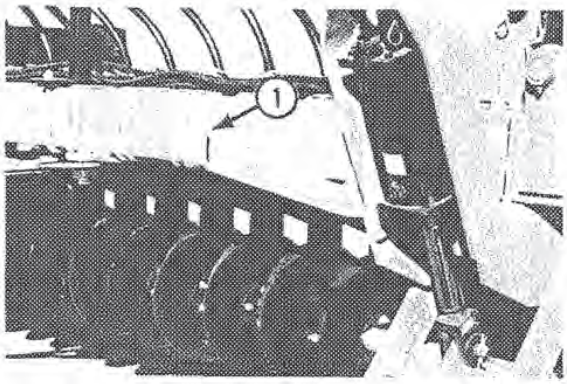


PHOTO NO. 4043

Raise toolbar up to full height, all five sections will be level at this time. Fold toolbar wings forward until toolbar guide (arrow 1) nose piece will enter wing rest plate.

STEP 26

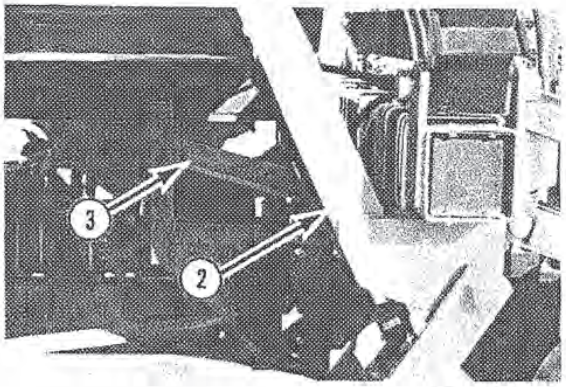


PHOTO NO. 4044

Fold toolbar wing all the way forward until toolbar guide (arrow 1) hits toolbar rest back stop (arrow 2). **NOTE:** Check that both sides are up to back stop before raising wheel lift arms and locking for transport.

IMPORTANT: When toolbar lowers onto toolbar rest, it will move rearward 2 to 3 inches. Failure to take precaution may result in bodily injury or equipment damage.

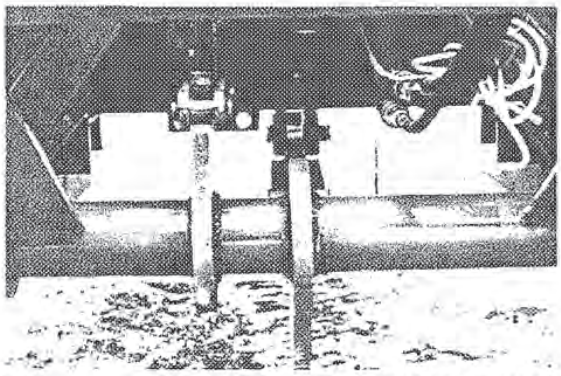


PHOTO NO. J102

NOTE: Make sure the transport lock arm clear the large cam and settles in the recessed groove before transporting. If it does not, adjust the center eye bolt on rockshaft lift cylinders.

STEP 27

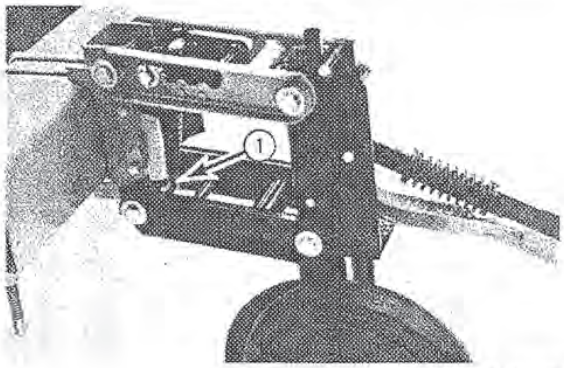


PHOTO NO. 3627

To insure uniform down pressure on all disc openers, check that the down pressure spring bottom hook is anchored on front 7/8 diameter tube. **NOTE:** This should be a start position for all units.

STEP 28

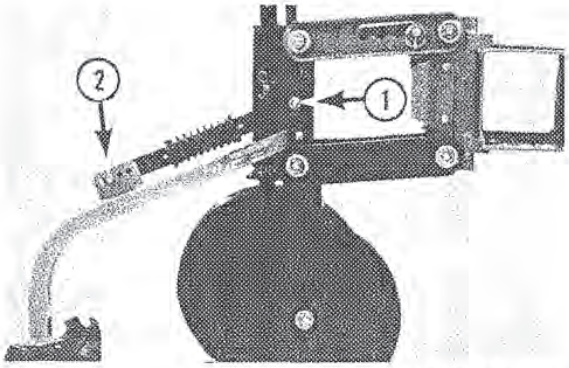


PHOTO NO. 3628

Check for uniform rotary closer down pressure strap anchor location front and rear. If required

move front into middle hole on rear mast (arrow 1, previous page). Move rear anchor into third hole (arrow 2) as shown in photo 3626.

NOTE: This should be a start position for all units.

STEP 29

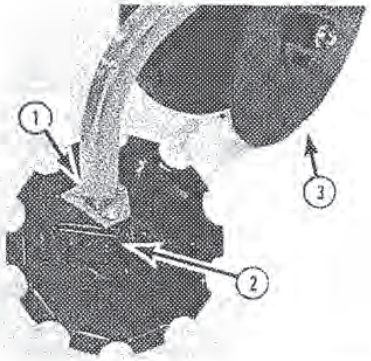


PHOTO NO. 3628

To insure uniform angle on all rotary closers, check that all units are flush at front edge (arrow 1) and the rotary closer bearing (arrow 2) is on the same side as the disc opener coulter (arrow 3).

NOTE: This should be a starting angle for all units.

STEP 30

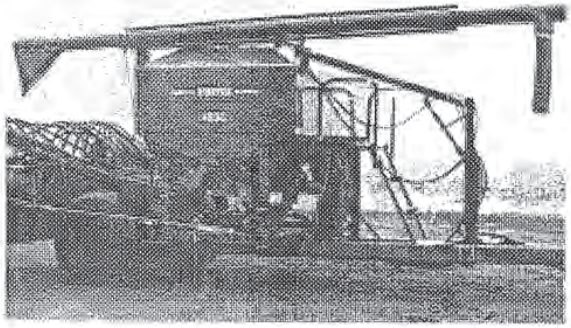


PHOTO NO. 3981

Install seed tube run from seed tank outlet to disc opener. See assembly diagrams on page 26 to 28 for proper length and position of hose running through hose guides.

STEP 31

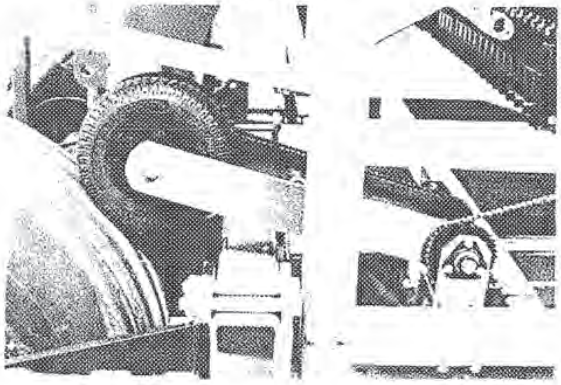
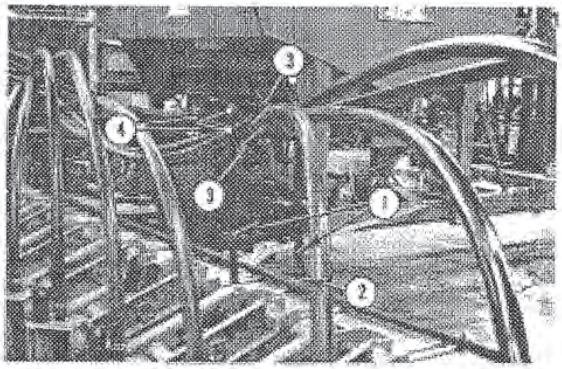


PHOTO NO. 4071

Install seed tubes through front hose rest.

NOTE: Seed tubes must run on top of shield over drive wheel.

STEP 32
40 FOOT TOOLBAR ONLY

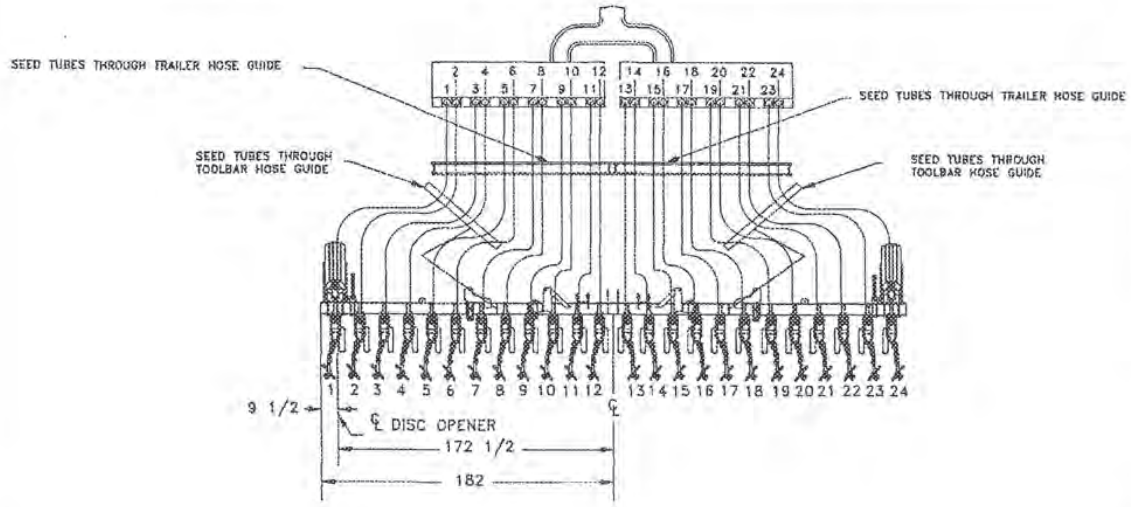


RH Shown PHOTO NO. 3983

Install (2) outer wing seed tube support straps (arrow 1) using (2) 1/2 x 8 1/2" hex bolt (arrow 2) with lockwasher and hex nuts. Install (2) cross straps (arrow 3) using (4) 3/8 x 1 1/2" hex bolt (arrow 4) with lockwasher and hex nuts.

NOTE: Number of seed tubes in support stand depends on number of outer toolbar disc openers.

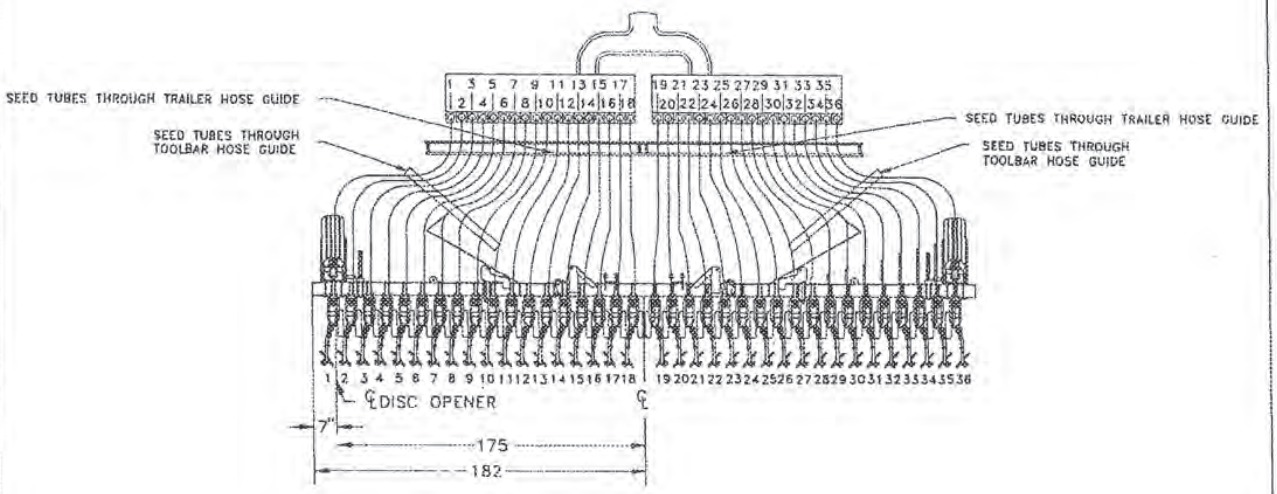
4831 30 FOOT 24 ROW 15 INCH SPACING							
SERIES 4800 AIR SEEDER	220 INCHES	206 INCHES	191 INCHES	180 INCHES	165 INCHES	154 INCHES	
HOSE NUMBER	1 & 24	2 & 23	3 & 22	4 & 21	5 & 20	6 & 19	
4831 30 FOOT 24 ROW 15 INCH SPACING							TOTAL HOSE LENGTH REQ'D
SERIES 4800 AIR SEEDER	146 INCHES	139 INCHES	129 INCHES	127 INCHES	122 INCHES	127 INCHES	320 FEET
HOSE NUMBER	7 & 18	8 & 17	9 & 16	10 & 15	11 & 14	10 & 15	



DWG. NO. 3 755

JM-22-0000394

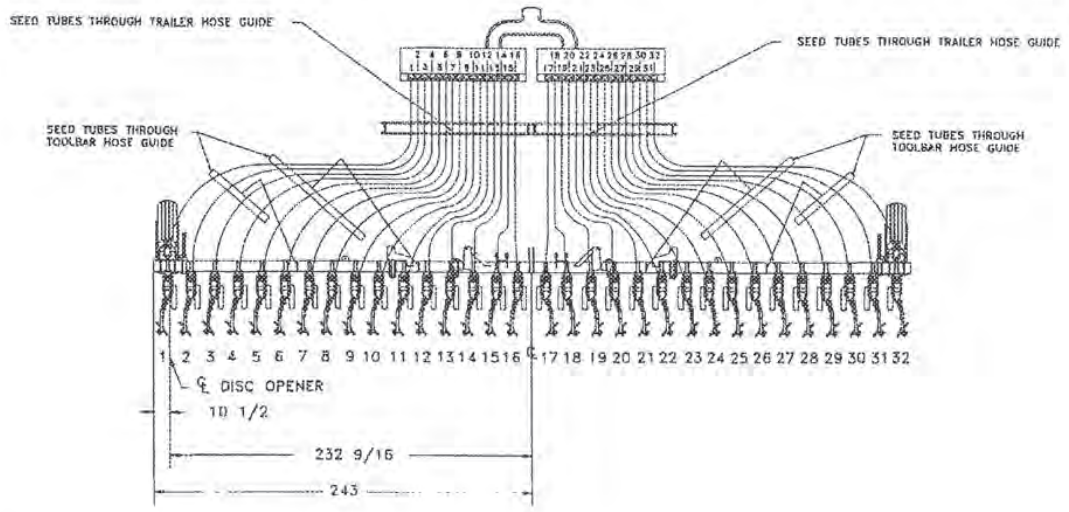
4832 30 FOOT 36 ROW 10 INCH SPACING										
SERIES 4800 AIR SEEDER	222 INCHES	212 INCHES	203 INCHES	192 INCHES	183 INCHES	177 INCHES	166 INCHES	157 INCHES	151 INCHES	
HOSE NUMBER	1 & 36	2 & 35	3 & 34	4 & 33	5 & 32	6 & 31	7 & 30	8 & 29	9 & 28	
4832 30 FOOT 36 ROW 10 INCH SPACING										TOTAL HOSE LENGTH REQ'D
SERIES 4800 AIR SEEDER	141 INCHES	136 INCHES	136 INCHES	136 INCHES	131 INCHES	126 INCHES	124 INCHES	119 INCHES	119 INCHES	475 FEET
HOSE NUMBER	10 & 27	11 & 26	12 & 25	13 & 24	14 & 23	15 & 22	16 & 21	17 & 20	18 & 19	



DWG. NO. 3754

JM-22-0000395

4833 40 FOOT 32 ROW 15 INCH SPACING									
SERIES 4800 AIR SEEDER	290 INCHES	285 INCHES	280 INCHES	235 INCHES	230 INCHES	206 INCHES	181 INCHES	180 INCHES	
HOSE NUMBER	1 & 32	2 & 31	3 & 30	4 & 29	5 & 28	6 & 27	7 & 26	8 & 25	
4833 40 FOOT 32 ROW 15 INCH SPACING									TOTAL HOSE LENGTH REQ'D
SERIES 4800 AIR SEEDER	164 INCHES	154 INCHES	148 INCHES	141 INCHES	138 INCHES	129 INCHES	127 INCHES	122 INCHES	492 FEET
HOSE NUMBER	9 & 24	10 & 23	11 & 22	12 & 21	13 & 20	14 & 19	15 & 18	16 & 17	



DWG NO. 3753

JM-22-0000396

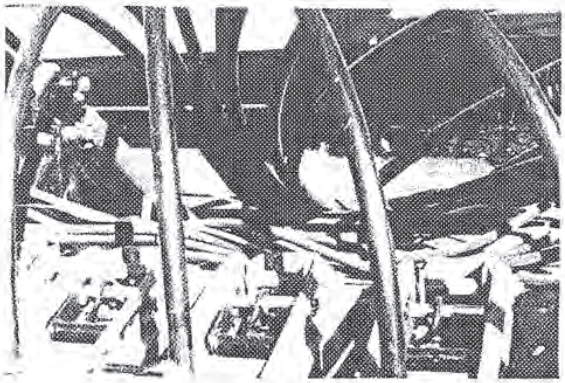


PHOTO NO. 4072

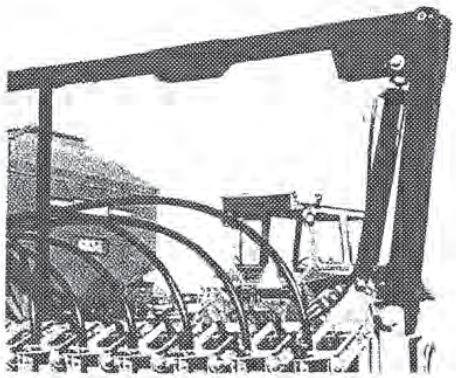


PHOTO NO. 4069

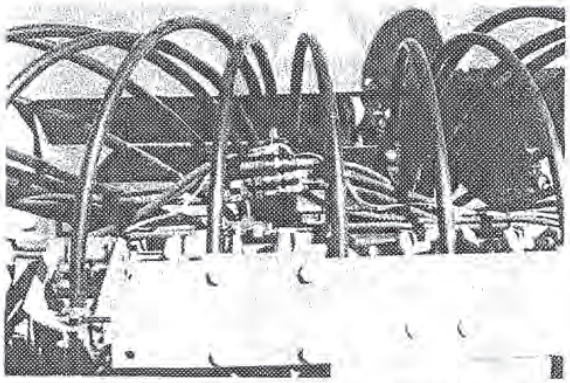


PHOTO NO. 4073

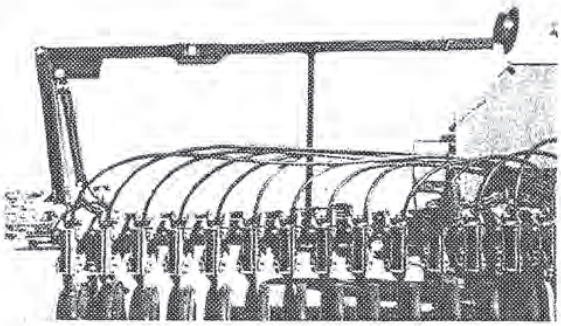


PHOTO NO. 4070

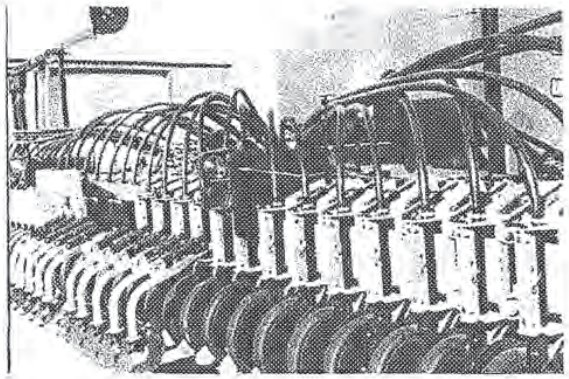
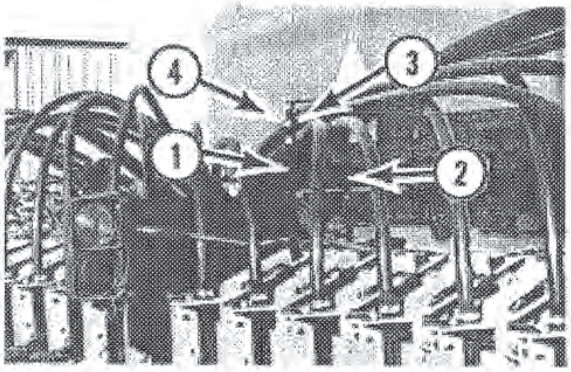


PHOTO NO. 4074

STEP 33
30 & 40 FOOT TOOLBAR

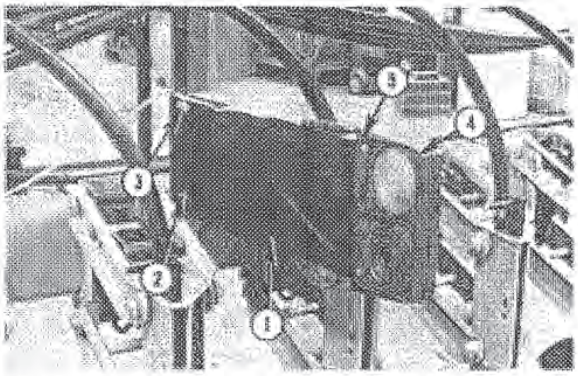


RH Shown PHOTO NO. 4060

Install (2) inner wing seed tube support and vertical strap (arrow 1) using (2) 1/2 x 8 1/2" hex bolt (arrow 2) with lockwasher and hex nut. Install cross straps (arrow 3) using (4) 3/8 x 1 1/2" hex bolt (arrow 4) with lockwasher and hex nuts.

NOTE: Number of seed tubes in support stand. 5 tubes in upper mount, 4 in lower for 30 foot 10 inch spacing.

STEP 34



RH Shown PHOTO NO. 3985

Install right and left hand light mount bracket (arrow 1) using (1) 1/2 x 8 1/2" hex bolt (arrow 2) and (1) 3/8 x 1 1/2" hex bolt (arrow 3) with lockwasher and hex nuts. Install light (arrow 4) using (4) 1/4 x 1 1/4" hex bolts (arrow 5) with 1/4" whiz nuts.

NOTE: Amber and red light will be visible from rear when toolbar is in transport.

STEP 35

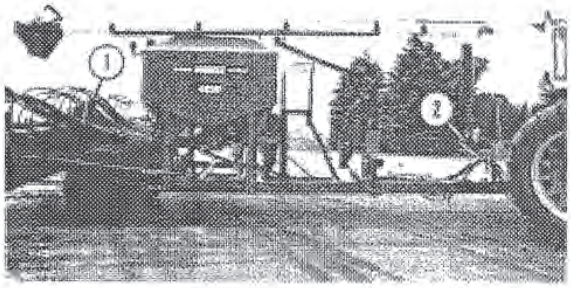


PHOTO NO. 3986

Continue to install all electrical wires using wiring diagram on page 32. Run rear light wire through rear pivot pin holder (arrow 1) and front 7-point plug wire through front loop (arrow 2).

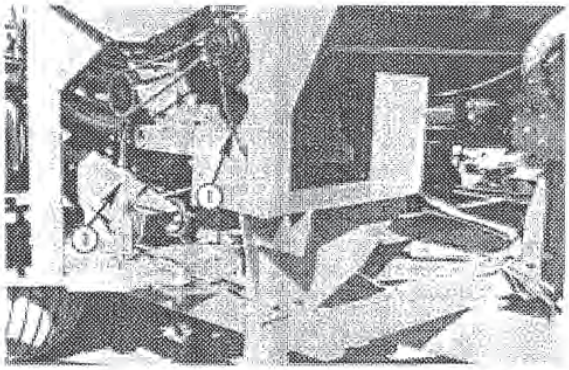


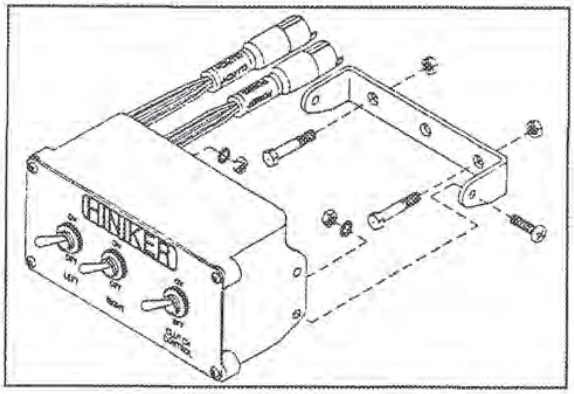
PHOTO NO. 3942B

Continue to install dual electric clutch wiring (arrow 1) and blocked seed detector wiring (arrow 2). Use wiring diagram on page 32.

CONSOLE INSTALLATION

CONSOLE INSTALLATION

Select an easily accessible area to mount the console in the tractor cab. Mount the bracket to the cab using the 1/4-20 bolts and nuts. Mount the console to the bracket using the #8-32 bolts and nuts.



DWG. NO. 3638

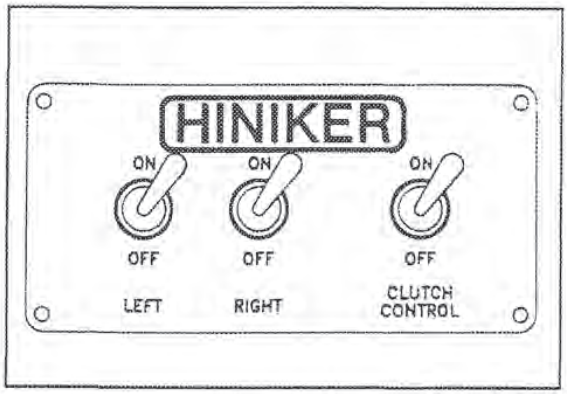
Attaching the lead with the circuit breaker to the positve battery terminal and the remaining lead to the negative terminal.

Route the 10 foot clutch cable from the clutch switch box to the hitch area of the tractor. Connect the 20 foot clutch cable to the 10 foot cable and route along the left tongue to the Seeder bin support. Connect the clutch "y" cable to the 20 foot cable and route to the clutches. The 2 pin connector with the Green and Black wires connects to the clutch on the right side and the 2 pin connector with the Red and Black wires connects to the clutch on the left side. Secure all wiring to the top of frame members to prevent possible damage by pinching or chafing.

NOTE: Allow room at the hitch for proper turning.

CLUTCH OPERATION

The Clutch Control Box has three switches. The two left most switches, labeled Left and Right, will determine which clutches will operate when the Clutch Control Switch is activated. The Clutch Control Switch, located on the right, is the master clutch control. This allows the ability to turn on either or both clutches with one switch.



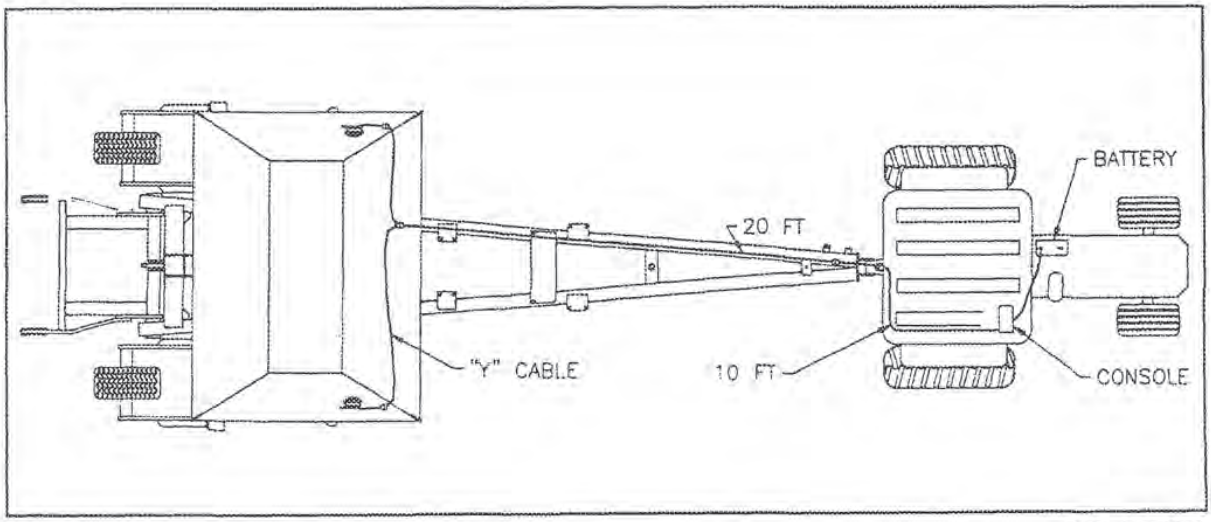
DWG. NO. 3639

Once the electric clutch is turned on, and the electric clutches engage activating the seed metering mechanism, a time delay will occur before the metered seed reaches the disc opener unit.

NOTE: Because the 4800 seeder has a ground wheel drive arrangement, the seeder must be in motion before the seed can be metered and delivered to the ground engaging seed boots.

Because of the previously mentioned start up time delay, "skips" could occur when stopping and starting the 4800 seeder in the field. To prevent these "skips" or unseeded areas, it may be necessary on headlands to turn seeder switch on approximately 10 feet before entering seeding point.

NOTE: Lower seed rates will require a greater distance. To determine correct distance for your seed rate, place a start flag and travel forward. Watch for seed coming out of seed boots, stop and measure that distance.



DWG. NO. 3640

4800 OPERATIONAL PROCEDURES

DEALER LOT
(manual page number in parenthesis)

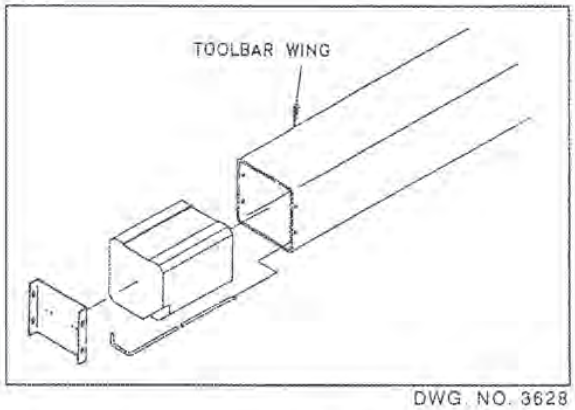
- Level frame parallel to ground.
  (See page 17 in Operators Manual.)
- Make sure 3rd arm parallel to lower arms.
  (See page 17 in Operators Manual.)
- Fold and unfold unit 6 or more times to purge air from hydraulic lines.
- Make sure wing guides against stop before lifting LA wheels for transport.
  (See page 15 in Operators Manual.)
- Make sure latch drops over cam into slot.
  (See page 15 in Operators Manual.)
- Set fan at 11 ounces. Increase only for high seed rates or very large seed size.
  (See page 27 in Operators Manual.)
- Remove expansion plugs in manifolds and blow out dust and debris.
  (See page 48 in Operators Manual.)

ASSEMBLY-OPTIONAL EQUIPMENT

BALLAST WEIGHT

ORDER ITEM NUMBER	DESCRIPTION
810-001-176	Concrete block 22 lbs. each.

QUANTITY REQUIRED	
30 Foot Toolbar	22
40 Foot Toolbar	38



DWG. NO. 3628

To add additional weight to toolbar, concrete blocks can be ordered. Install concrete blocks as shown.

NOTE: Position of block pull rod and large corner notch to the inside.

WEIGHT BRACKET

ORDER ITEM NUMBER	DESCRIPTION
80305512	Weight Bracket Components

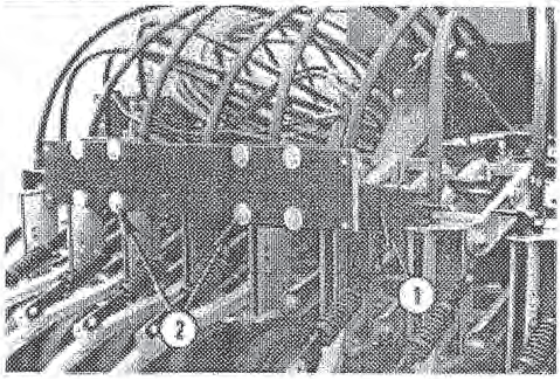


PHOTO. NO. 3988

Install tractor front suitcase weight mounting bracket (arrow 1), using (4) 5/8" u-bolts and (8) 5/8" lockwashers and (8) hex nuts (arrow 2).

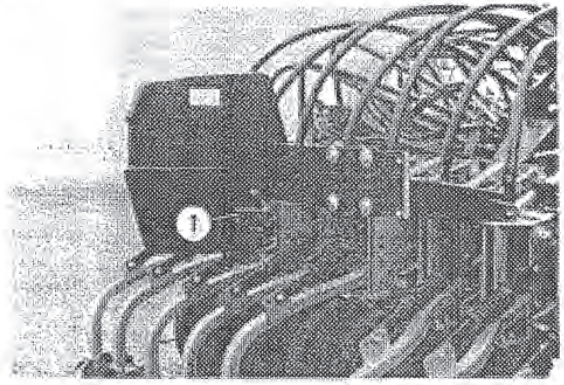


PHOTO NO. 3989

Case/IH suitcase weights fit this mounting. The clamping lock (arrow 1) fits on the bottom edge of mounting bracket.

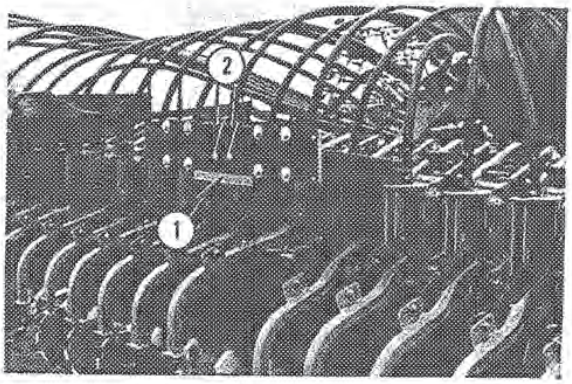


PHOTO NO. 3990

To fit JD suit case weights, lower support (arrow 1) must be installed using (2) 5/8 x 2" carriage bolts with (2) 5/8 lockwashers and (2) 5/8 hex nuts (arrow 2).

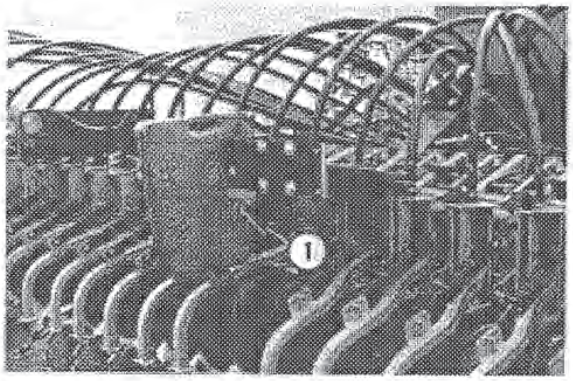
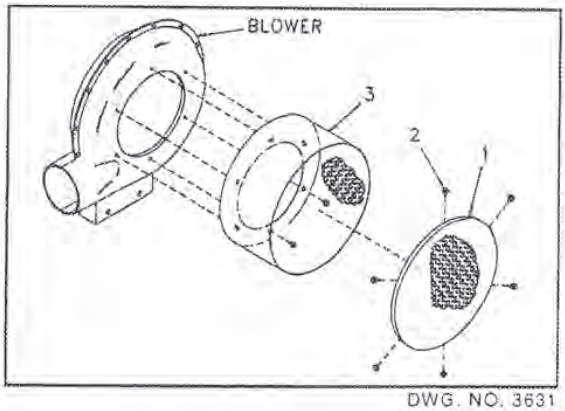


PHOTO NO. 3991

Shown in photo: JD suitcase weight attached to weight bracket assembly. Notice locking stud in the middle (arrow 1). A minimum of (2) suit case weights must be used. Secure with through bolts.

AIR BLOWER SCREEN

ORDER ITEM NUMBER	DESCRIPTION
80305510	Blower Screen Components



DWG. NO. 3631

To avoid clogging the air inlet screen of the air blower with possible debris, a cylindrical screen is offered as an option. The cylindrical screen has a larger surface area compared to the flat screen offered with the 4836 tank/trailer. The additional surface area still allows enough air to flow into the air blower even if debris begins to clog the screen.

The cylindrical screen is attached to the blower using the (6) 1/4" self tapping screws and washers that are currently used to attach the flat screen onto the blower. The screen cover is attached to the cylindrical screen with (6) 1/4" self tapping screws which are included with this option.

FILL AUGER

ORDER ITEM NUMBER	DESCRIPTION
80305509	Fill Auger Components

A fill auger can be ordered as an option with the unit. You have a choice of either an auger made by Kasco Manufacturing or Remlinger Manufacturing. Included with the fill auger are the components needed for it's support. The fill auger support is attached to the trailer and allows the fill auger to rotate easily for use in the field or for transporting.

First, the front and rear support brackets must be attached to the tank. Two people will be needed for this operation. The front bracket (arrow 1) is attached at the front of the tank on the right side. The rear bracket (arrow 2) is attached at the rear of the tank, also on the right side. The brackets are attached by first removing the first (2) 5/16 whiz lock bolts (arrow 3) on the right side of the tank. One person will need to get inside the tank to hold the whiz lock nuts as the bolts are being removed.

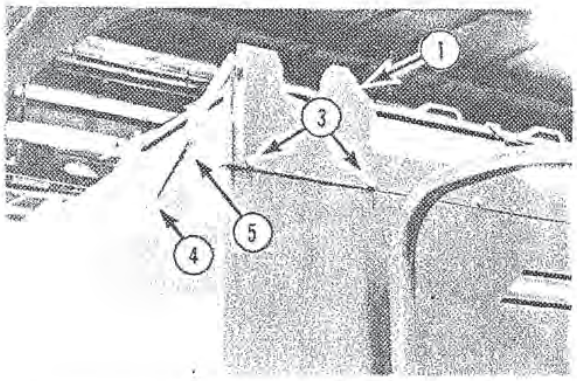


PHOTO NO. 4063

Remove the (4) 5/16 whiz bolts and discard. Drill out the four holes to 17/32 diameter. Line up the bottom holes of the front and rear support brackets. Insert the 1/2 by 1 1/2" long (Item 3) bolts through the 3 pieces and secure using 1/2 whiz locknuts.

Remove the second 5/16 whiz bolt (Item 4) from the front on the right side of the tank. Secure the front top (17 3/4") (Item 5) to the front auger support weld using a 3/8 by 1 1/4 bolt and whiz nut (Itme 23, 24).

Put (8) 3/8 flat washers (Item 21) between the front strap and front auger support weld. Secure the other end of the strap to the second hole in the right side of the tank using the 5/16 x 3/4 whiz bolt and whiz nut.

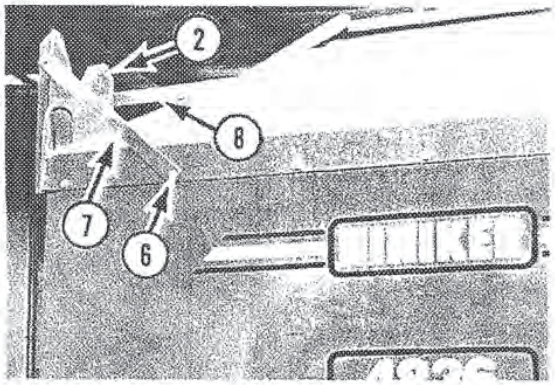


PHOTO NO. 4065

Remove the second 5/16 whiz bolt from the right rear side of the tank (Item 6). Attach the 20" long side strap (Item 7) to the tank using the bolt just removed. Fasten the strap to the rear auger support weld using a 3/8 x 3/4 bolt and whiz locknut.

Fasten the 17" long strap (Item 7) to the rear auger support using a 3/8 x 3/4 bolt and whiz nut.

Remove the 3/8 by 1 bolt and the (2) 3/8 locknuts used to attach the cover weld to the tank. Use a 3/8 by 1 1/2 full thread bolt to secure the rear strap (Item 8) to the lug on the rear hopper top half weld.

Put a two way locknut on the bolt as a spacer between the lug and the strap. Secure the strap using a 3/8 locknut. Make sure the strap is free to move.

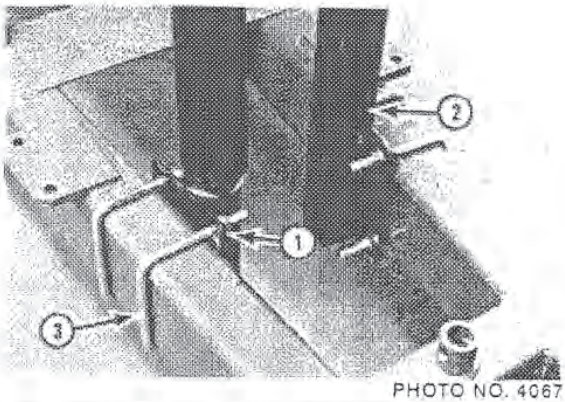


PHOTO NO. 4067

Attach the outer tube weld (arrow 1) to the right trailer tongue in front of the front mounting plate, using (2) of the 5/8" u-bolts provided.

Attach the lower support weld (arrow 2) to the left side of the trailer in front of the front mounting plate, using the other (2) 5/8" u-bolts. Make sure the upper braces of the lower support weld face toward the center of the trailer.

Set the spacer (arrow 3) on top of the outer tube weld.

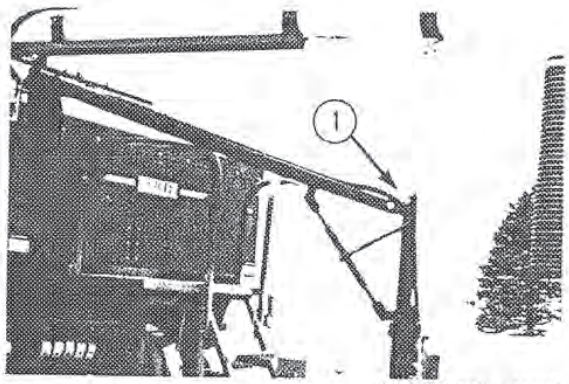
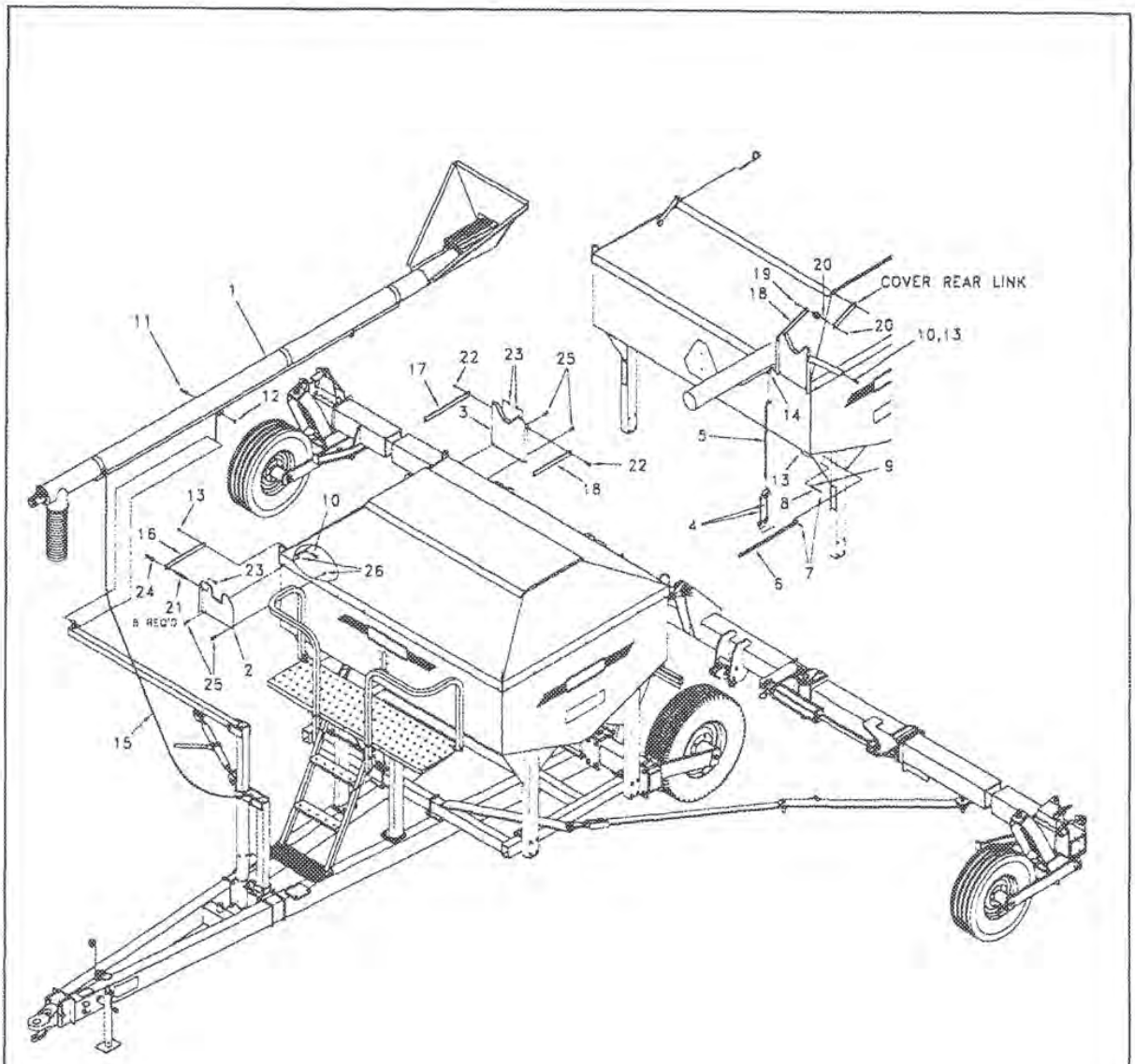


PHOTO NO. J1078

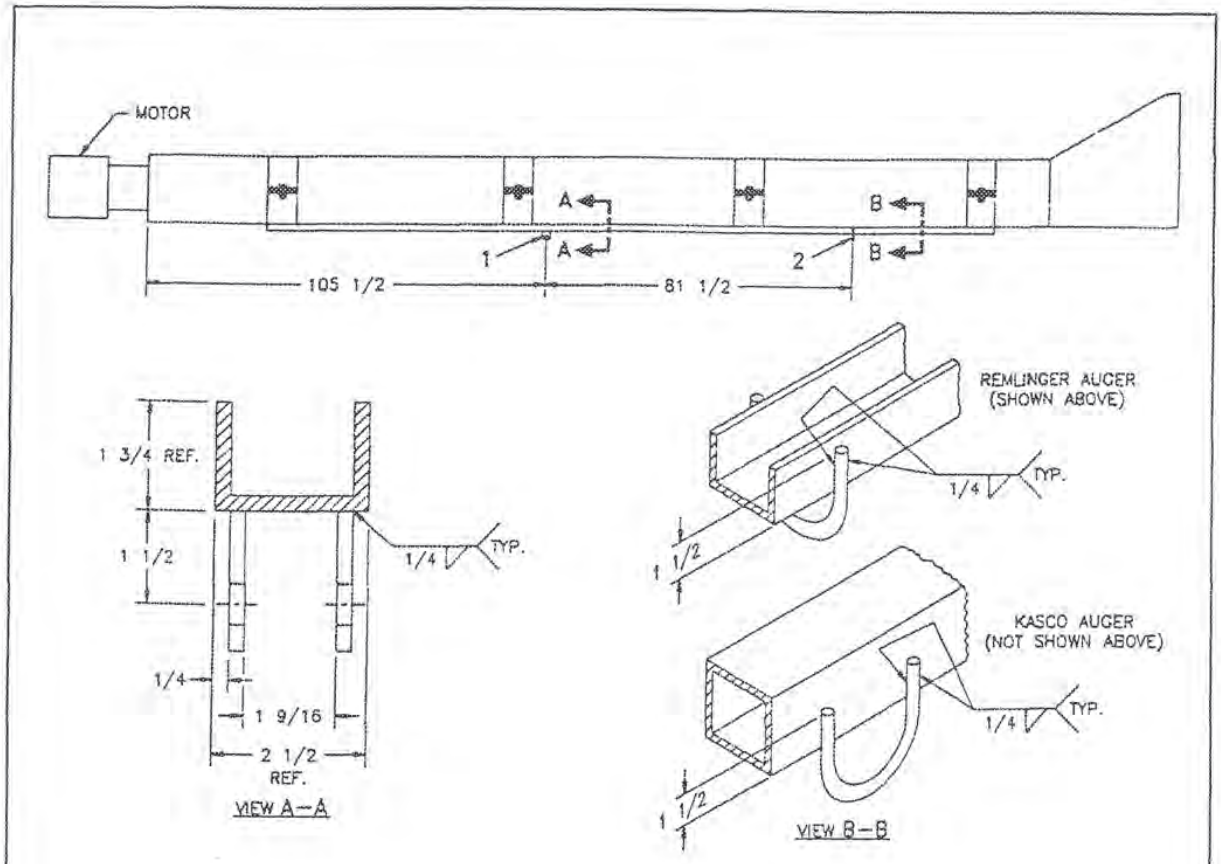
Insert the vertical tube weld (arrow 1) so the bottom of the weld goes through the outer collar of the lower support weld, the spacer and the outer tube weld. The collar of the vertical tube weld should line up inside the collar of the lower support weld. Some adjustment may be needed with the placement of the outer tube weld and lower support weld on the trailer to assure proper alignment for the vertical tube weld to be inserted.



DWG. NO. 3672A

REF. NO.	PART NUMBER	DESCRIPTION	QTY	REF. NO.	PART NUMBER	DESCRIPTION	QTY
1		Remlinger or Kasco		14	80305520	Horse Shoe Tab	1
2	80504730	Front Auger Support Weld	1	15	80305578	Rope	1
3	80504737	Rear Auger Support Weld	1	16	80504734	Front Strap 17 3/4 Long	1
4	622684	Tarp Strap	2	17	80504733	Side Strap 20" Long	1
5	80305530	Rod	1	18	80504732	Rear Strap 17" Long	1
6	80305531	Handle Lever	1	19	700-20099	HHCS 3/8-16 NC Full THF x 1 1/2	1
7	950-001-110	Hex Head Cap Screw 5/16-18 x 1 Gr. 5	2	20	951-005-051	Lock Nut 3/8-16 NC 2-Way	2
8	033-12007	5/16 Flat Washer SAE PL	1	21	952-002-003	3/8 Flat Washers	9
9	80305532	Spacer	1	22	950-001-089	HHCS 3/8-16 NC x 3/4	2
10	950-002--006	Bolt-HHFL WZLK 5/16-18 x 3/4	1	23	951-002-006	Whiz Nut 3/8-16 UNC	3
11	031-06308	HHCS 5/8-11 UNC x 2 3/4 Gr. 5	1	24	950-001-106	HHCS 3/8-16 UNC x 1 1/4 Lg Gr. 5	1
12	951-005-044	Lock Nut 2-Way 5/8-11	1	25	950-001-125	HHCS 1/2-13 NC x 1 1/2 Lg	4
13	951-002-002	Nut-FL WZLK 5/16-18	2	26	951-002-004	Whiz Nut 1/2-13 NC	4

JM-22-0000406



DWG. NO. 3652

REF. NO.	PART NUMBER	DESCRIPTION	QTY	REF. NO.	PART NUMBER	DESCRIPTION	QTY
1	80305519	Support Tab	2	2	80305520	Horseshoe Tab	1

NOTE: If auger is not balanced properly, the auger clamps can be loosened, and the auger moved forward or backward, depending upon proper balance of the auger.

REMINGER AUGER

To prepare the Remlinger Auger for proper installation, a small amount of welding is needed. Two support tabs need to be welded to the channel, as shown in view A-A of the drawing above. A horseshoe tab also needs to be welded to the channel, as shown in the top drawing of view B-B. The horseshoe tab must be welded 81 1/2 inches from the support tabs. After installing the auger onto the support, if auger is not balanced properly, the clamps can be loosened and the auger moved until it is balanced.

KASCO AUGER

To prepare the Kasco Auger for proper installation, a small amount of welding is needed. Unlike, the Remlinger auger, the support tabs are already welded to the tubing provided with the auger. The horseshoe tab still needs to be welded 81 1/2 inches from the support tabs as shown in the bottom drawing of view B-B. After installing the auger onto the support, if auger is not balanced properly, the clamps can be loosened and the auger moved until it is balanced.

Once the vertical tube weld has been inserted properly, tighten the 5/8" u-bolts to torque and insert the 3/8" bolt and nut to the bottom of the vertical tube weld.

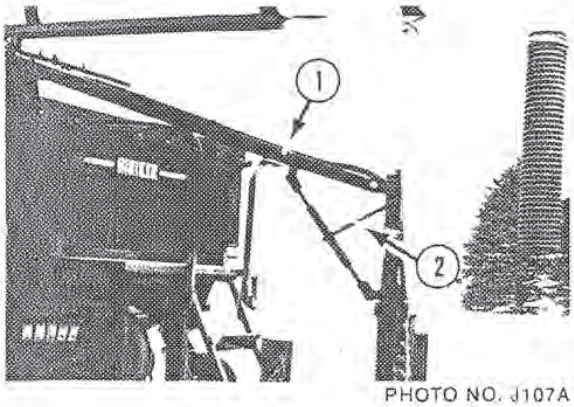


PHOTO NO. J107A

Attach the swing arm weld (arrow 1) to the vertical tube weld. Line up the holes on the square tubing of the swing arm with the holes on the swing arm supports of the vertical tube weld, and insert the 3/4" bolt and nut. The ratchet jack (arrow 2) can be attached to the ratchet jack supports on the swing arm and the vertical tube weld as shown in the picture above. Install 10' rope, to upper clamp as shown in photo J107A.

FILL AUGER
Installation of Rear Anchor Lever

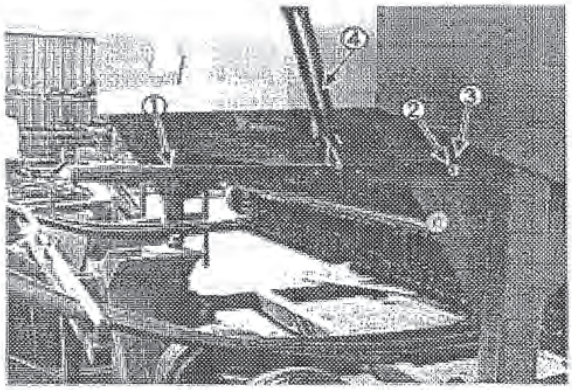


PHOTO NO. J106A

Install lever (Arrow 1), use end hole as shown in photo. Install (1) 5/16 x 1 1/4 inch long hex bolt (Arrow 2) using 5/16 flat washer with 5/16 hex lock nut on inside. This will be assembled loose so lever is free to pivot. Install (1) 5/16 x 1 1/4 inch long hex bolt (Arrow 3) using one large 1 1/4 OD washer and spacer with 5/16 hex lock nut on inside. Install two tarp straps (Arrow 4) as shown in photo.

4836 AIRSEEDER FILL AUGER POSITIONING

The Fill Auger is designed for one-man operation; however, two important instructions must be followed.

1. The auger must be balanced in the support assembly with slightly more weight on the hopper end.

2. A rope must be attached to the forward clamp on the support frame.

Follow the pictured sequential procedure below and the following page:

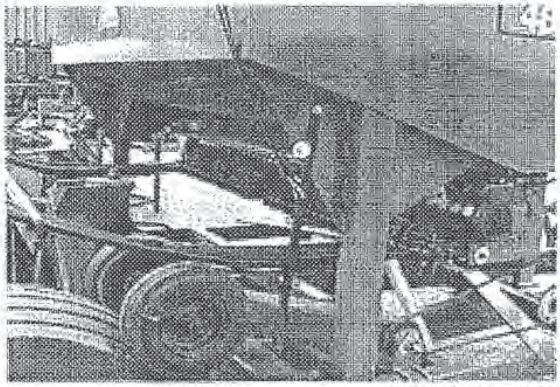


PHOTO NO. J105

1. Auger lever secured.

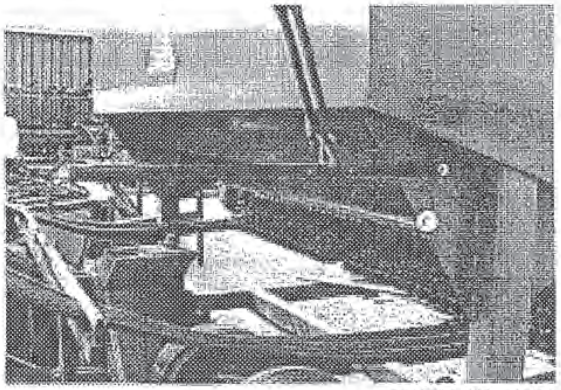


PHOTO NO. J106

2. Auger lever released. Unhook hold-down rod from auger support.

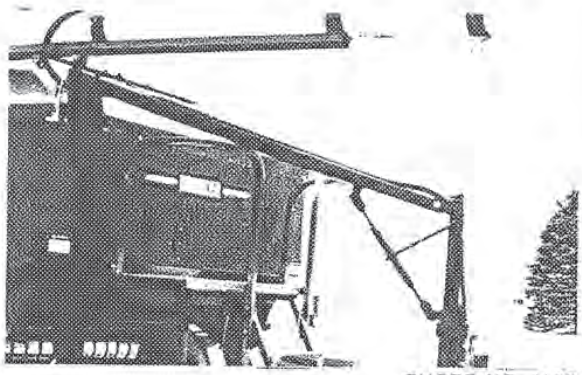


PHOTO NO. J107

3. Ratchet auger out of front cradle support.

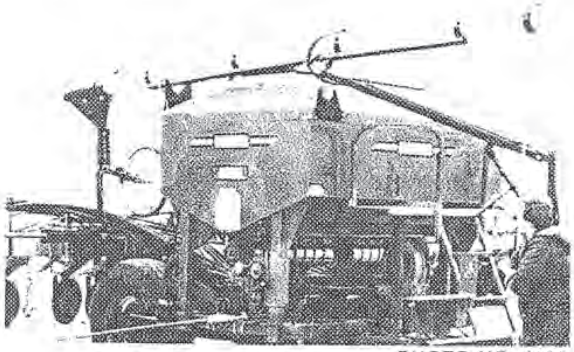


PHOTO NO. J108

4. Pull rope to lift auger out of rear cradle and maneuver to the desired position. With the hopper end of auger on the ground, lower the auger to the correct height for filling, by using the ratchet. Reverse procedure for transport. Make sure the auger is secured both in the front and rear saddle before transport.

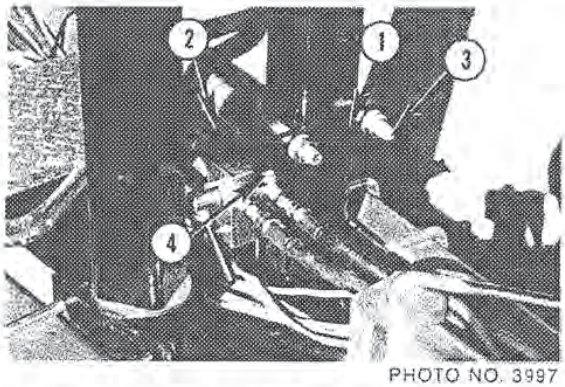
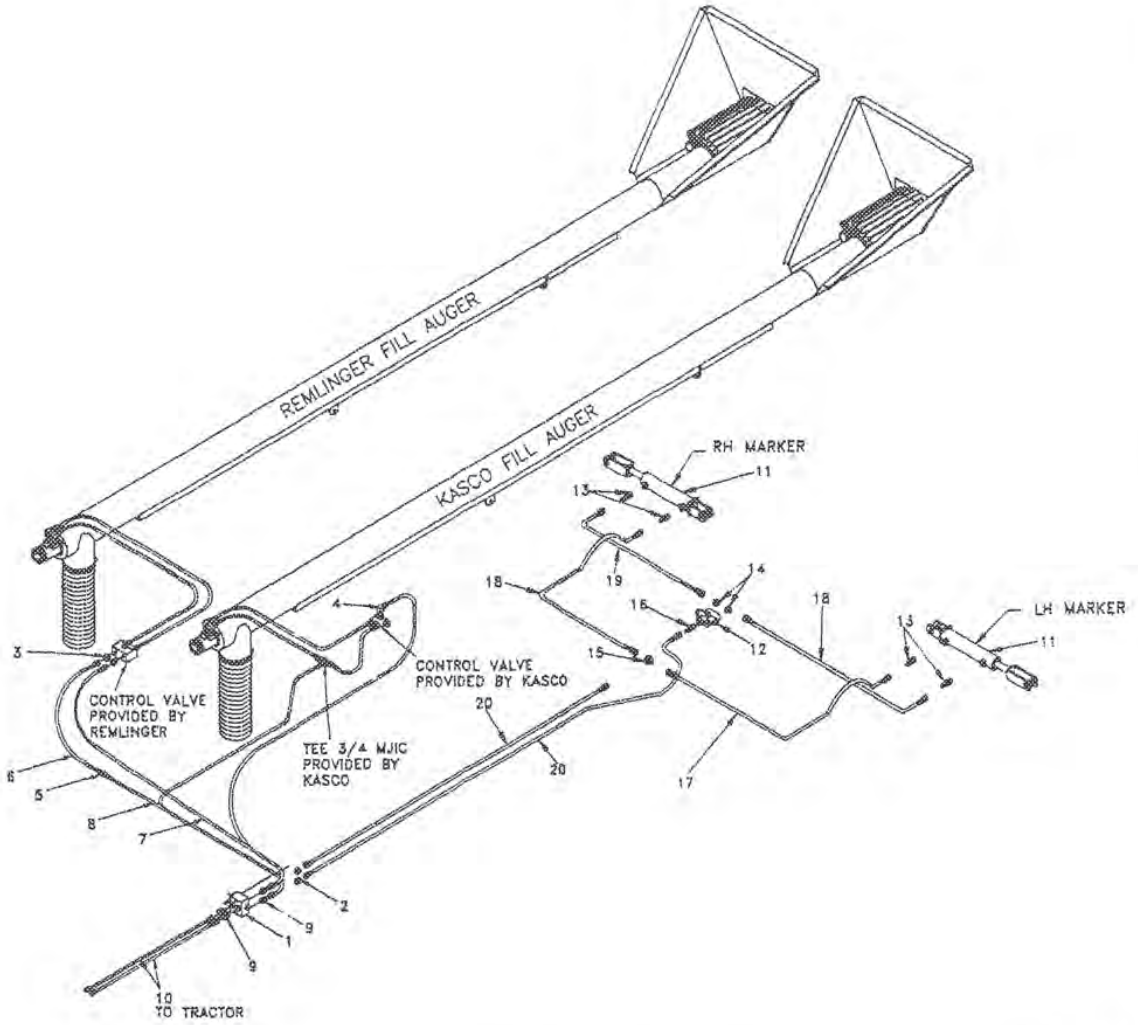


PHOTO NO. 3997

Install hydraulic selector valve using selector valve anchor (Arrow 1) and rear strap (Arrow 2) with (2) 3/4 x 4" hex bolt (Arrow 3) and (2) lockwashers and hex nuts. Install (1) 5/16 x 1 3/4" hex bolt (Arrow 4) with whiz lock nut. Install hydraulic plumbing as shown in diagram on page 42.

OPTIONAL HYDRAULICS
MARKERS & FILL AUGERS

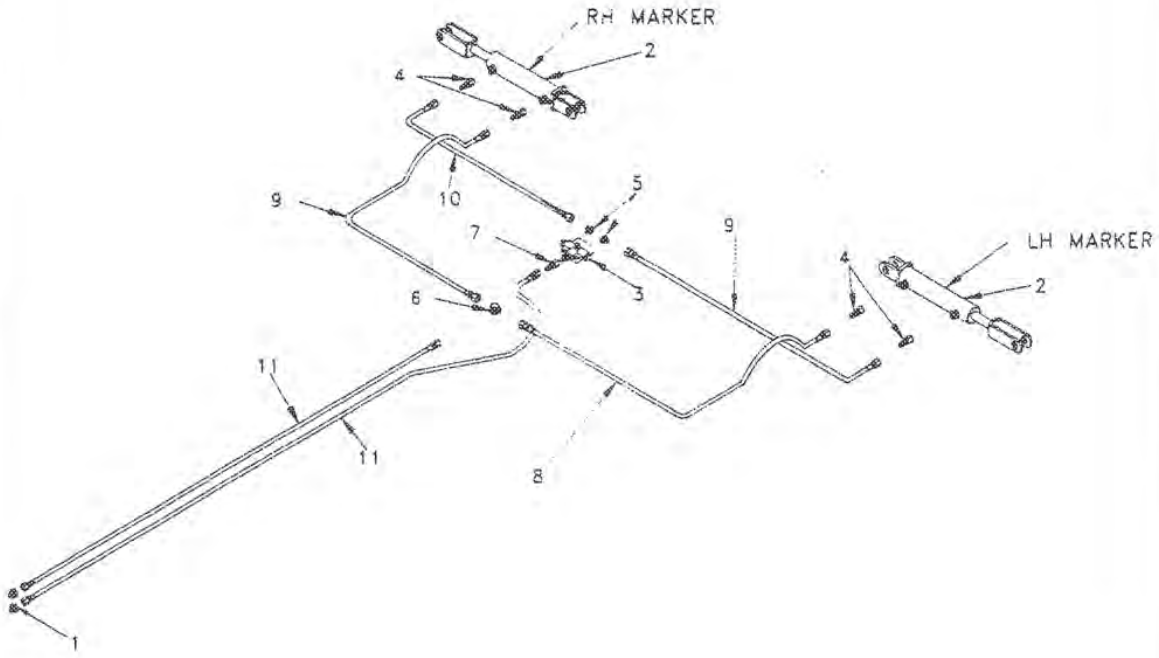


HINIKER P/N 80305509, 80305585 & 80305586 DWG. NO. 3779

REF. NO.	PART NUMBER	DESCRIPTION	QTY.	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	80305516	HYD Valve	1	12	805-003-026	Sequence Valve	1
2	203-35510	O-Ring Pipe Plug	2	13	956-008-024	Restrictor Fitting	4
3	956-003-003	Fitting-Straight Adapter 1/2 MNPT x 9/16 MJIC	2	14	956-005-001	Fitting-Elbow 90°	2
				15	956-007-003	Fitting-Tee	1
4	956-005-003	Fitting-Elbow 90° 1/2 MNPT x 9/16 MJIC	1	16	956-003-001	Fitting STR. APT. 3/4 ORB x 9/16 MJIC	1
5	209-01019	Union 3/4 MJIC (2)	1	17	957-001-074	40' Hose Assy 3/8 x 240"	1
6	957-005-021	Hose Assy 3/8 x 50"	1		957-001-074	30' Hose Assy 3/8 x 240"	1
7	957-001-074	Hose Assy 3/8 x 240"	1	18	957-001-079	40' Hose Assy 3/8 x 260"	2
8	957-005-003	Hose Assy 3/8 x 191"	1		957-001-079	30' Hose Assy 3/8 x 260"	2
9	956-003-001	STR-ADPT 9/16 MJIC x 3/4 MORB	4	19	957-004-080	40' Hose Assy 3/8 x 284"	1
10	957-004-014	Hose Assy 3/8 x 318"	2		957-004-080	30' Hose Assy 3/8 x 284"	1
11	624129	2 1/2 x 24 CYL Assy PMC #AR-265	2	20	957-004-014	40' Hose Assy 3/8 x 318"	2
			1		957-004-014	30' Hose Assy 3/8 x 318"	2

JM-22-0000410

HINIKER MARKER HYDRAULICS



HINIKER P/N 80305585, 80305586 DWG. NO. 3777

REF. NO.	PART NUMBER	DESCRIPTION	QTY.	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	957-004-014		2	8	957-001-074	40' Hose Assy 3/8 x 240"	1
2	624129	2 1/2 x 24 CYL Assy PMC #AR-265	2		957-001-074	30' Hose Assy 3/8 x 240"	1
3	805-003-026	Sequence Valve	1	9	957-001-079	40' Hose Assy 3/8 x 260"	2
4	956-008-024	Restrictor Filting	4		957-001-079	30' Hose Assy 3/8 x 260"	2
5	956-005-001	Fitting-Elbow 90°	2	10	957-004-080	40' Hose Assy 3/8 x 284"	1
6	956-007-003	Fitting-Tee	1		957-004-080	30' Hose Assy 3/8 x 284"	1
7	956-003-001	Fitting STR. APT. 3/4 ORB x 9/16 MJIC	1	11	957-004-014	40' Hose Assy 3/8 x 318"	2
					957-004-014	30' Hose Assy 3/8 x 318"	2

JM-22-0000411

HINIKER MARKER ASSEMBLY

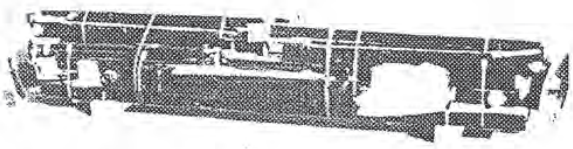


PHOTO NO. 4068

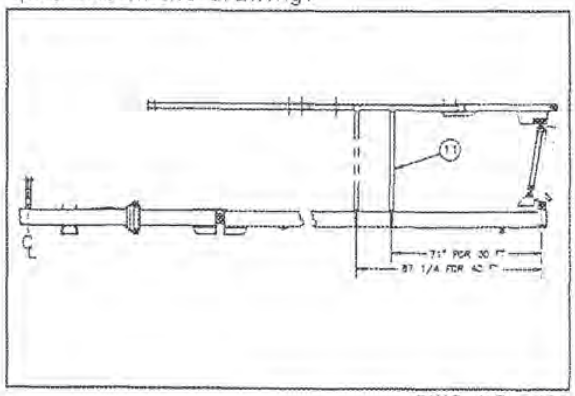
Remove all bands from the shipping bundle. Attach the base tube welds (Item 1) using the 1 5/8" by 11" pin. Secure the pin using (2) 3 8" x 2 3/4" bolts, lock washers and nuts. Let the base tube rest on the stops on the wing toolbar end plate.

Attach the upper arm welds (Item 4) to the base tube welds using the 1 1/2" by 10 1 8" pin and (2) 3/8 x 2 1/2" bolts. Support the end of the upper arm weld using a saw horse.

Attach the right outer marker assembly to the upper arm weld on the right end of the toolbar using a 3/4 x 4 1/2" bolt and two way locknut. **NOTE:** the marker disc throws soil out.

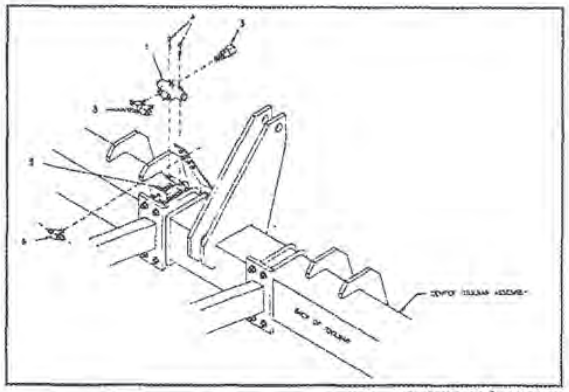
Secure the right outer marker assembly with a 3/8 x 4 1/2" bolt, lockwasher and nut. Do the same on the left side of the machine.

Attach the rest welds to the wing toolbars as shown in drawing number 3762. Secure rest welds using the 3/4 inch u-bolts lockwashers and nuts. Make sure they are at the dimension specified in the drawing.



DWG. NO. 3762

Attach the valve mounting bracket (Item 5) to the center toolbar assembly. Use the two 1/2 hose clamps to secure the valve mounting bracket. If the suitcase weight adapter is installed, use the outer left u-bolt to secure the valve mounting bracket as shown in drawing number 3763.



DWG. NO. 3763

Turn a 3/4 ORB to 9/16 JIC fitting adapter (Item 2) into the in port of the sequence valve. Turn a 90° elbow (Item 3) into both ports on the rear of the sequence valve.

Attach the sequence valve assembly to the valve mounting bracket using (2) 3/8 x 1 1/2" bolts, (Item 4) lockwashers and nuts.See pages 43 and 16 for hydraulic hosing. Attach a 3/8 x 3/8" long hose to the straight adapter going into the sequence valve.

Attach a 3/8 x 3/8" long hose to the bulkhead tee fitting (Item 6) after securing it to the bulkhead plate. Mount the base end of the 2 1/2 x 24" stroke hydraulic cylinders to the wing toolbars using the pin provided with the hydraulic cylinder.

Attach hoses to cylinders using restrictor fitting.

WARNING: BEFORE ATTACHING HYDRAULIC MARKER CYLINDERS TO MARKER ALL CAPTIVE AIR MUST BE REMOVED FROM THE SYSTEM.

Support marker fold cylinders on wooden blocks so rods can be extended and retracted without interference.

Connect hoses to the tractor. Fully extend and retract marker cylinder at least two times, maintaining hydraulic pressure at full extension for at least 30 seconds. Then extend

cylinders one more time, maintaining pressure at full extension for one minute. This allows all air to escape from the marker cylinders.

⚠ WARNING: BE SURE CYLINDERS AND ATTACHING HOSES ARE FULLY CHARGED WITH OIL BEFORE OPERATING SYSTEMS. FAILURE TO DO SO WILL ALLOW MARKERS TO FALL RAPIDLY WHEN ATTEMPTING TO LOWER FROM TRANSPORT POSITION.

Remove the wood blocks and lower the rod end of the cylinder. Attach rod end of the marker lift cylinders to the guide strap between the ears on the upper arm weld. Use the 1 x 5 1/32" pin and secure the pin in the slots using 5/16 by 2 spring pin and flat washers.

Activate the tractor hydraulic system until the marker cylinders are fully extended. Hold the tractor lever in that position for several minutes to purge air out of the system. Cycle the marker system part way up and down several times to purge air from the system. Raise the marker very slowly the first time.

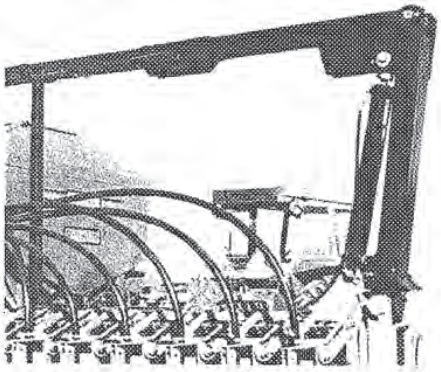


PHOTO NO. 4069

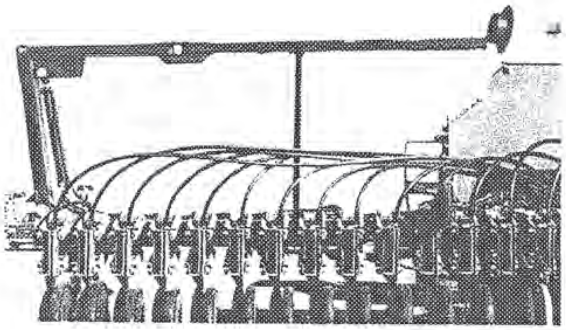


PHOTO NO. 4070

SOIL DEFLECTOR

Remove the parts for the right and left scrapers from the box. Attach the right hand soil deflector bracket (Item 1) to the right hand row unit using the 5/16 x 1 carriage bolts (Item 2) and 5/16 whiz lock nuts a s shown in photo 4062A. Do the same for the left hand soil deflector bracket on the left row units.

Secure the soil deflector pad (Item 30 to the soil deflector bracket using (2) 3/8 x 1 carriage bolts (Item 4), lockwashers and nuts as shown in photo 4061A. The carriage bolt must be assembled with the head below the plastic soil deflector pad so that soil and plant material will not catch on the bolts and nuts.

Adjust the bracket and the soil deflector pad so that there is about a 1/8" gap between the soil deflector pad and the row unit coulter as shown in photo 4062A. Tighten all the carriage bolts at this time.

The soil deflector should be adjusted under field conditions as part of setting the air seeder toolbar.

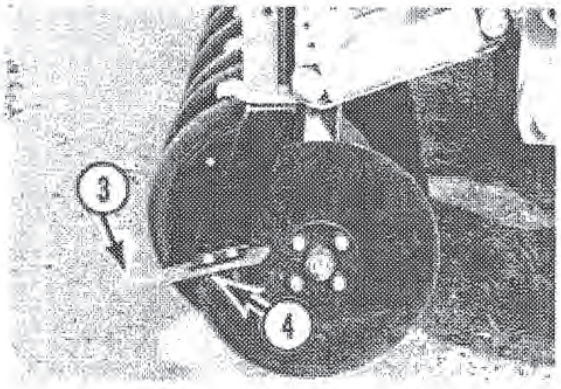


PHOTO NO. 4061A

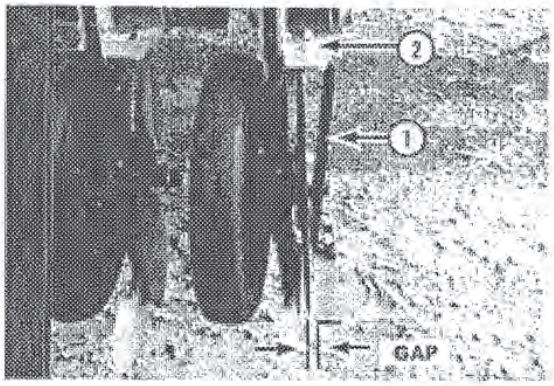


PHOTO NO. 4062A

JM-22-0000413

BIN LEVEL

The Bin Level Sensor is used to detect low bin seed levels. When used in with the 5815 Blocked Seed Tube Detector for model 5824 Seeder or with the 360-010-000 base kit for the model 4836 Seeder, the system will warn the operator when the seed level falls below the sensor. This level is determined by the placement height of the sensor in the bin.

BIN LEVEL SENSOR-INSTALLATION

To start the Bin Level Sensor installation, locate and center punch a spot on the BACK side of the seed bin, approximately 1 inch below the inside cross-member. Drill a 3/4 inch hole for the sensor cable to feed through.

NOTE: Make sure the seed bin cross-member located on the inside of the bin is not in the way of the hole.

On year 2000 models of the 5824 and 4836 seeder carts the holes for mounting the bin level sensor mounting bracket are pre-drilled into the bin cross member. On earlier models use the bin sensor bracket and use it as a guide to mark two places on the cross member: Bottom inside of the seed bin (see photos 3128 & J103). Center punch and drill both holes with a 9/32 inch drill.

Use the 1/4-20 x 3/4 hexhead cap screws and 1/4-20 Whiziok nuts and bolt the bracke to the frame cross-member. Use the #10-32 x 1/2 inch roundhead screws, #10 split washers, and #10-32 hex nuts to secure the bin level sensor to the bracket.

The bin level sensor was changed in 1999. The first version mounted horizontally as shown in photo 3128. The new version mounts vertically as shown in photo J103.

Multiple holes are provided for bin alarm set-point adjustment.

Route the bin level sensor cable through the hole previously drilled in the seed bin wall and move the grommet down the cable. Inset the grommet in the drilled hole to seal it.

Cable tie the bin level sensor cable to the underside of the cross-member to prevent unwanted movement.

Connect the sensor cable to 10' or 20' bin level extension cables and route up to the 5815 console mounted in the tractor cab. Connect to the console pigtail marked bin level. Secure all wiring using proper length wire ties.

NOTE: Allow room at hitch for proper turning.

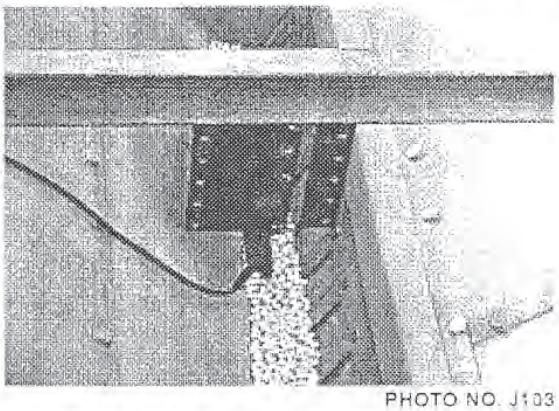


PHOTO NO. J103

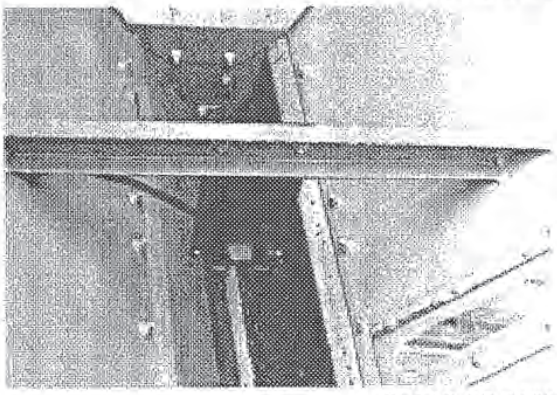


PHOTO NO. 3128

BLOCKED SEED TUBE DETECTOR WITH DUAL CLUTCH MACHINES

Install the Dual Clutch Box bracket in a convenient location. Mount the Blocked Seed Tube Detector to the Dual Clutch Box using the two mounting plates and hardware as shown in figure 1.

Connect the cables marked Power to the proper consoles, then route to the battery and connect as shown in figure 2.

Connect the Adapter cable to the proper connections on the Dual Clutch Box and the Blocked Seed Tube Detector as shown in figure 2. There is no connection to the cable maked Clutch on the Blocked Seed Tube Detector. Connect the wto 20 foot Seed Sensor Cables to the Left and Right bank of sensors at the center of the Seeder as shown in figure 2. the 1 foot Jumper cable between the Left and Right Sensor bank in not used. Route these cables to the hitch, connect to the 10 foot Seed Sensor cables, and continue to route to the Console area. Connect these cables to the adapter ends marked Left and Right.

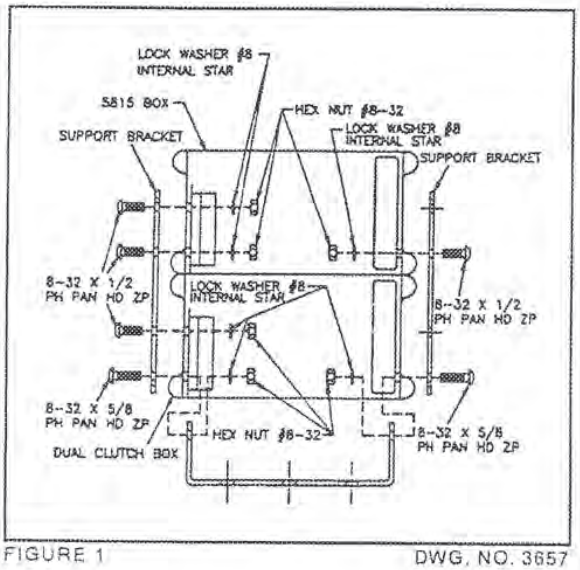


FIGURE 1 DWG. NO. 3657

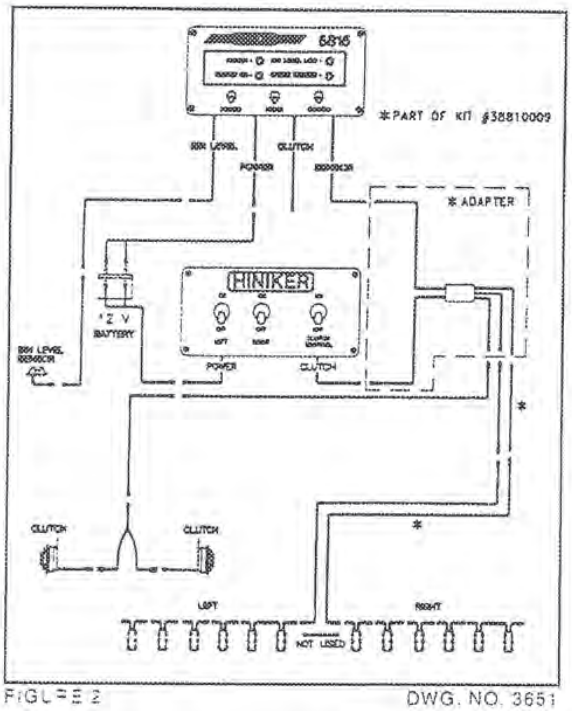


FIGURE 2 DWG. NO. 3651

OPERATION

Refer to the 5815 Operators manual for a description of the various funcitons of the Blocked Seed Tube Detector. For use with dual clutch machines the Clutch switch on the blocked Seed Tube Detector will be let in the **on** position and **not** used. Clutch control will be accomplihed using the Dual Clutch Box. Use the master Clutch switch to turn the clutches on and off. The Left and Right switches will disable the **sensors** and **clutch** for the side that is turned off. This will allow the remaining side to operate normally.

NOTE: If a Warning error occurs when shutting off the Left or Right switches, reset by switching the Master clutch switch off then back on.

HINIKER SERVICE LITERATURE

A. PARTS CATALOG - P/N 80305579

4830 parts book is available from your Hiniker dealer. It lists service parts for your machine with exploded illustrations to help you identify the correct parts. It is also helpful in assembling and disassembling.

B. OPERATORS MANUAL - P/N 80504784

The operators manual provides safety, operating, maintenance and service information about Hiniker 4831, 4832, 4833 Airdrill.

C. ASSEMBLY MANUAL - P/N 80504785

Contains set up instructions for the Hiniker 4836 Air Seeder Cart and the options available for it.

CONTACT YOUR HINIKER DEALER
OR CONTACT:

HINIKER COMPANY
AIRPORT ROAD
PO BOX 3407
MANKATO, MN 56002-3407

(507)625-6621

Effective July 21, 1999
(Subject to change without notice.)

HINIKER 4831, 4832, & 4833 AIR SEEDER

STANDARD EQUIPMENT

- 150 Bushel Seed Cart with 3 Point Hitch
- 14 GPM Hydraulic Motor and Blower
- 36 Seed Outlets - 12 Blanking Plates
- 600 Ft. Air/Seed Hose
- Dual Electric Clutches with Cab Control
- 30 Ft. or 40 Ft. Forward Folding Toolbar including Cylinders, Hoses and Gauge Wheels with correspording Number of 4602 Seeder Row Units
- 7" x 7" Toolbar
- SMV Emblem

Independently Mounted Seed Units Equipped With:

- 10" Single Disk Seed Openers (Minimum Row Spacing - 10 Inches)
- Parallel Linkage Suspension
- 3" x 16" Rubber Gauge Wheel w/Wrenchless Down-Pressure Adjustment
- Adjustable Seeding Depth
- Seed Firming Blade
- Adjustable Angled Steel Closing Wheel

TRANSPORT WIDTH: 16 FT.

ITEM NUMBER	DESCRIPTION	Row Spacing	APPROX. WEIGHT	LIST PRICE*
4831	150 BU Seed Cart with 30 Ft. Toolbar and 24 Row Units	15"	10,350 lb.	$ 38,950.00
4832	150 BU Seed Cart with 30 Ft. Toolbar and 36 Row Units	10"	12,050 lb.	45,840.00
4833	150 BU Seed Cart with 40 Ft. Toolbar and 32 Row Units	15"	11,700 lb.	43,280.00

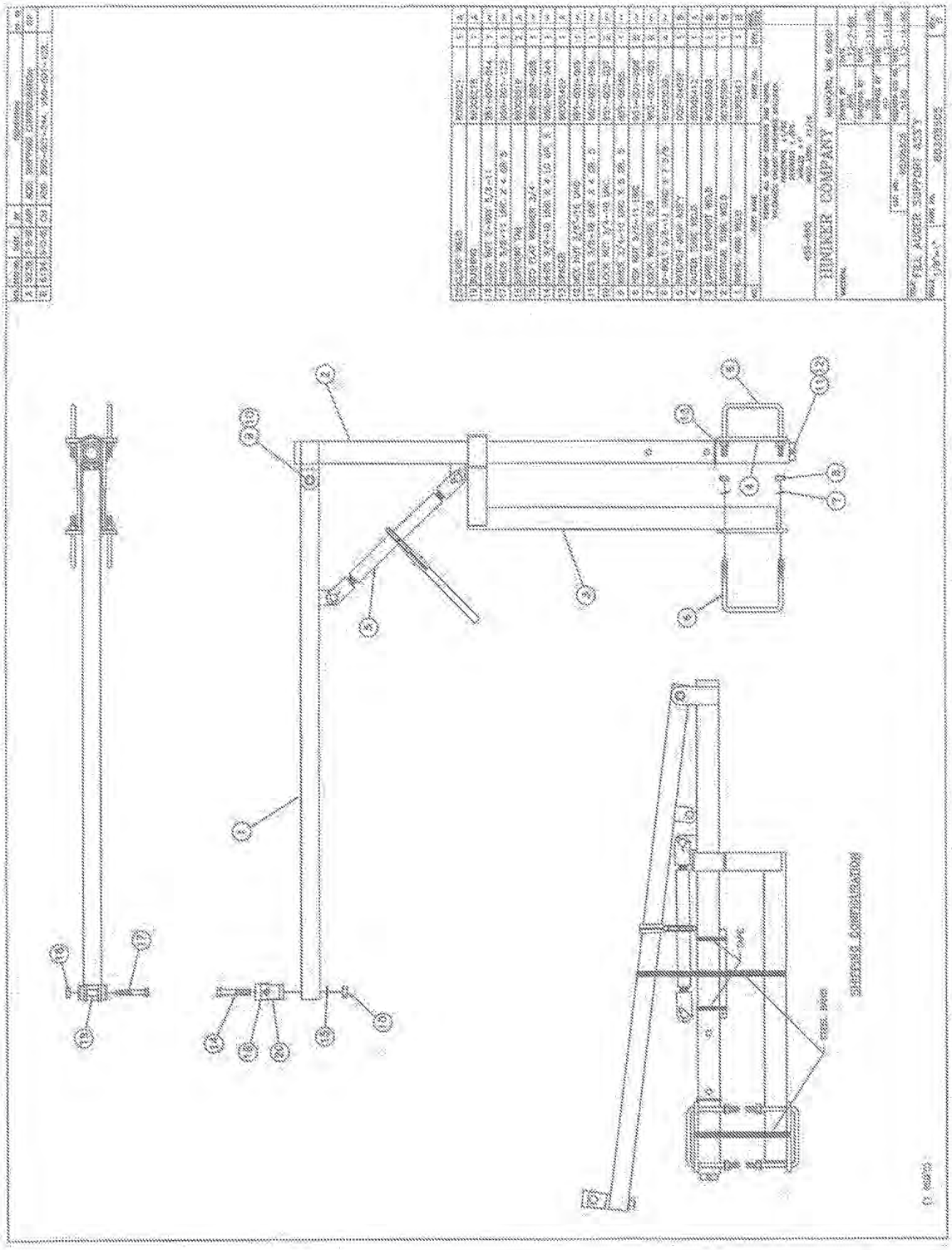
OPTIONAL EQUIPMENT

803058[illegible]	30 Ft. Row Marker	394 lb.	$ 2,530.00
803058[illegible]	40 Ft. Row Marker	[illegible] lb.	2,600.00
803058[illegible]	Auger Mount Kit (Includes Hoses from Auger Valve to Splitter Valve and from Splitter Valve to Tractor) (Does Not Include Auger) (Auger Requirement: 23 Ft. x 8" Recommended Vendor, Kasco or Remington)	313 lb.	606.00
803058[illegible]	Soil Deflector (2 Row Bundle)	7 lb.	85.00
803058[illegible]	Weight Bracket (Holds JD or Case Suitcase Weights)	137 lb.	270.00
810-001-[illegible]	Ballast Blocks 28 for 30 Ft. Front Fold 38 for 40 Ft. Front Fold	32.5 lb.	8.00

*All Prices F.O.B. Mankato, MN
[illegible]

45

JM-22-0000417



JM-22-0000418

HINIKER

4800 Soybean Planter



- Designed For Heavy Residues & Tough Soils
- Accurate Seed Placement In Both No-till And Conventional Seedbeds
- Individual Seed Metering On Every Row
- Available In 15', 20', 30', 40' And 45' Widths



A Planter Designed Specifically For Soybeans

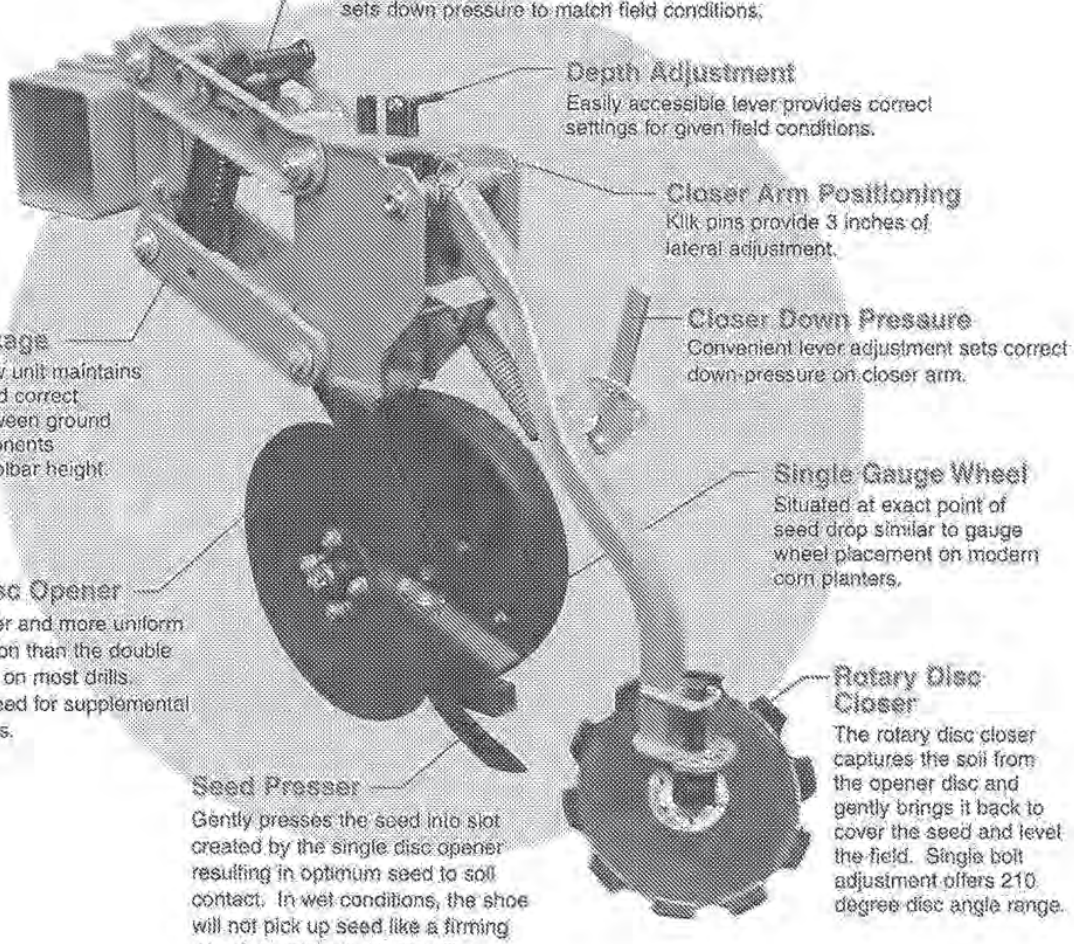
JM-22-0000419

It All Starts With
The VERSATILE 4800 ROW UNIT

Get precise depth control *and* accurate, high speed volumetric seed metering with the Hiniker 4800 Soybean Planter.

The 4800 combines the filling speed and convenience of a single large seed hopper, the versatility of a single disc seed opener, and the accurate depth control of individual "drop-point" depth gauge wheels.

Simple and accessible adjustments permit rapid transition in changing field conditions from tough no-till to soft conventional soils.



Down Pressure Adjustment
Four-notch wrenchless adjustment effortlessly sets down pressure to match field conditions.

Depth Adjustment
Easily accessible lever provides correct settings for given field conditions.

Closer Arm Positioning
Klik pins provide 3 inches of lateral adjustment.

Parallel Linkage
Ensures that row unit maintains proper depth and correct relationship between ground engaging components regardless of toolbar height.

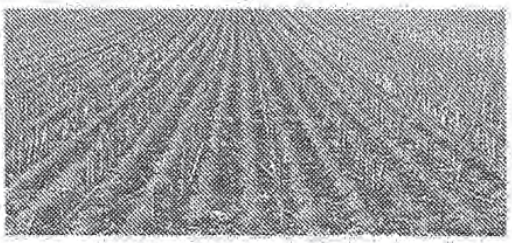
Closer Down Pressure
Convenient lever adjustment sets correct down-pressure on closer arm.

Single Gauge Wheel
Situated at exact point of seed drop similar to gauge wheel placement on modern corn planters.

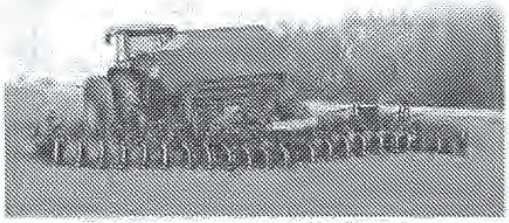
Single Disc Opener
Permits easier and more uniform soil penetration than the double disc openers on most drills. Eliminates need for supplemental fluted coulters.

Rotary Disc Closer
The rotary disc closer captures the soil from the opener disc and gently brings it back to cover the seed and level the field. Single bolt adjustment offers 210 degree disc angle range.

Seed Presser
Gently presses the seed into slot created by the single disc opener resulting in optimum seed to soil contact. In wet conditions, the shoe will not pick up seed like a firming wheel or promote crusting like surface packing wheels.



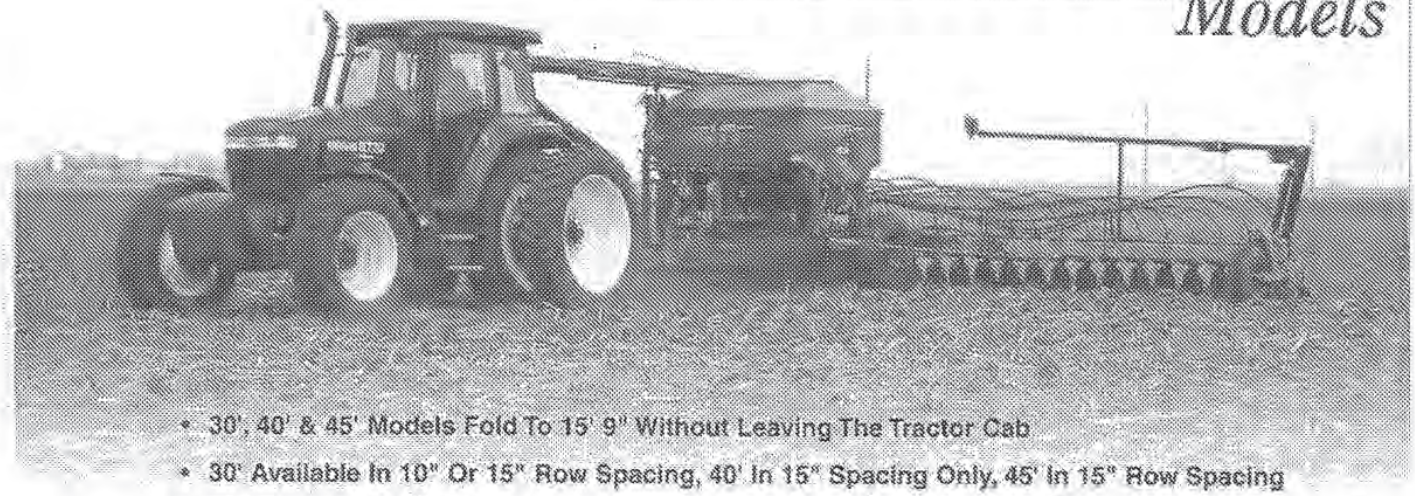
The Hiniker 4800 (15") places the row exactly 7½" between the old row and the wheeltrack area, unlike a splitter corn planter which places the seed in the corn stubble and the compacted wheel tracks.



The 4860 toolbar is hinged both horizontally, to enable 90 degree front folding, and vertically to permit wing float of as much as 15 degrees in rolling terrain.

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4860 FRONT FOLDING *Models*

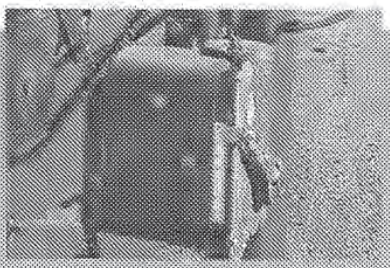


- 30', 40' & 45' Models Fold To 15' 9" Without Leaving The Tractor Cab
- 30' Available In 10" Or 15" Row Spacing, 40' In 15" Spacing Only, 45' In 15" Row Spacing
- 130 Bushel Seed Tank
- Individual Row Metering Assures Accurate Seed Count In Every Row

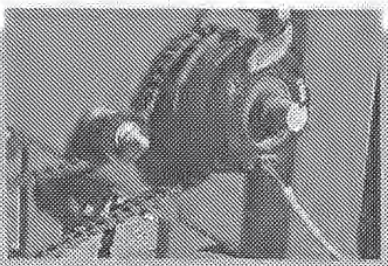
STANDARD *Features*



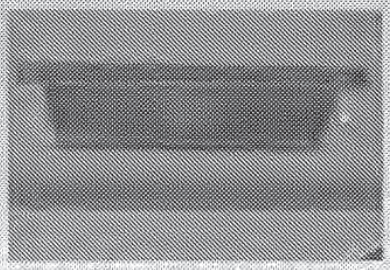
Hiniker seedcarts INDIVIDUALLY AND GENTLY METER the seed to each row, unlike air units that use a single meter which then shoots the seed through splitters and towers.



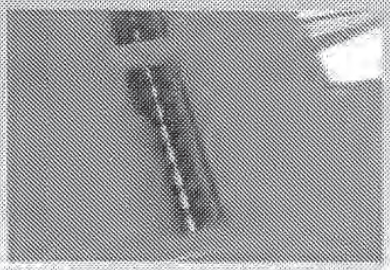
Both the 4860 and the 4824 seedcarts feature the ZERO MAX SEEDING RATE TRANSMISSION. By simply adjusting a dial on the transmission, the correct seeding rate is selected on the linear scale.



The seed metering system is ground driven allowing for UNIFORM SEED RATES regardless of ground speed. The 4860 model features two clutches permitting half of the machine to be turned off.



Two easily ACCESSIBLE SLIDE GATES permit complete hopper cleanout without any scooping.

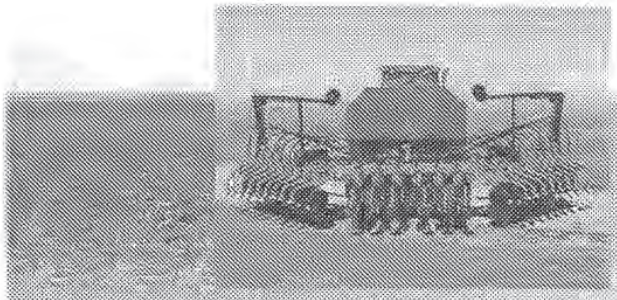


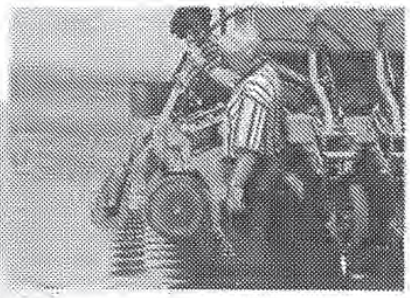
SEED HOPPER AGITATOR prevents seed bridging.



MECHANICAL DRIVE WHEEL LIFT automatically disengages seed flow when toolbar is raised, both when turning on end rows and when in transport.

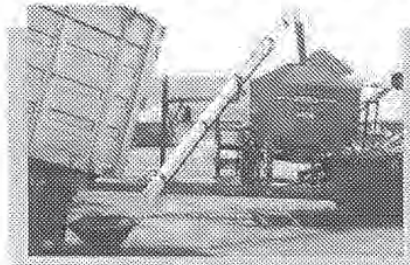
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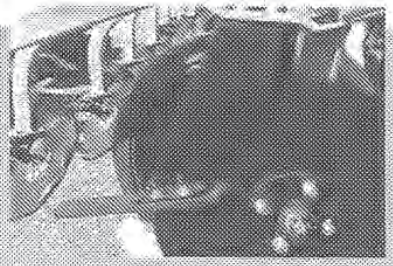


With fields often located miles apart, safe road travel has become a real concern. The 30', 40' and 45' 4860 models fold to less than 18' transport width. Vertical lockup of closer arms reduces overall transport width to 13' 6". Safety lights are standard equipment.

OPTIONAL *Features*



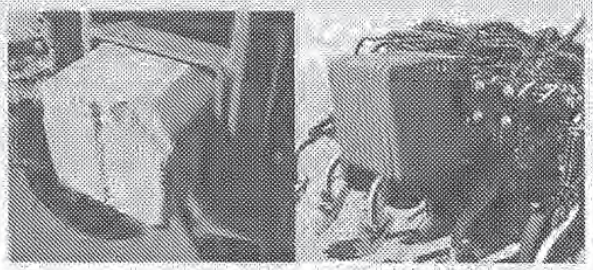
FILL AUGERS are available for both seedcart models. The auger may be used to both fill and empty the seed hopper when changing seed varieties.



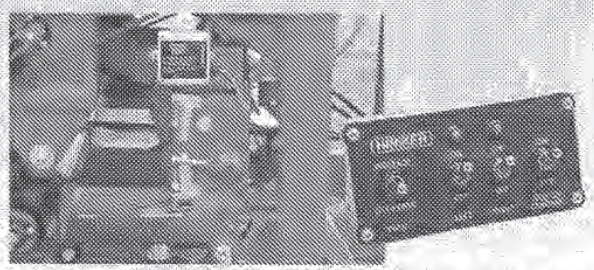
SOIL DEFLECTORS deflect soil from the opening disc back into the closing disc ensuring seed coverage.



ROW MARKERS are available for the front folding 4860 seeder. These rugged markers attach to welded on toolbar mountings and feature breakaway protection when post or tree obstructions are encountered.



When no-till conditions demand, CONCRETE BALLAST BLOCKS and SUITCASE WEIGHT BRACKETS ensure proper penetration of row units.



Add an optional REMOTE RATE CONTROL package to your 4800 seeder and adjust seeding rates from inside the tractor cab. Population monitor users can now adjust seeding rates on-the-go to match changing seed sizes or field conditions. A second adjustment switch is located on the Zero-Max seeder transmission for convenient access when calibrating seed rates.

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The First and *Only* Planter
DESIGNED SPECIFICALLY FOR SOYBEANS



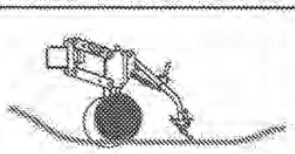
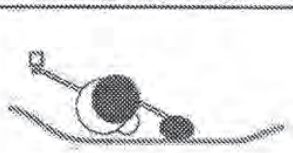
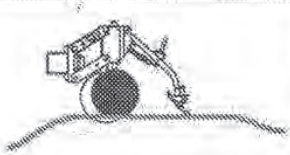
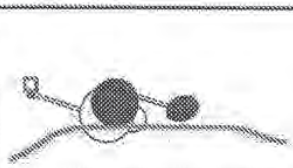
CORN PLANTERS AND DRILLS — HINIKER SOYBEAN PLANTER

SEED GERMINATION & EMERGENCE PHYSIOLOGY		CORN PLANTER	DRILLS	HINIKER SOYBEAN PLANTER
CORN	• Requires firm seed to soil contact for proper germination. • Sends narrow spiral shoot.	Firms soil tightly around seed for necessary seed to soil contact.	Not designed for corn.	Not designed for corn.
SMALL GRAIN	• Small seed requires tight seed to soil contact without air pockets. • Narrow spike emerges from shallow depth.	Not designed for small grains.	Ideally suited for all cereal grains.	Precision depth control ensures excellent stands if 10" minimum row spacing is acceptable.
SOYBEANS	• Germination less dependent on firmed soil surface. • Must push wide fragile cotyledon to soil surface.	Crusting caused by tightly firmed soil over the row may compromise emergence.	Trailing gauge wheel creates two problems: 1. Imprecise depth control requires over-seeding 2. Firmed soil over row may create crusting problems similar to corn planters.	Uniform depth and seed firming provide excellent germination. Unpacked soil over firmed seed prevents crusting and emergence problems.

Precision seed depth placement without surface crusting.

Two critical design characteristics set the Hiniker 4800 soybean planter apart from other machines that are designed primarily for corn and small grains.

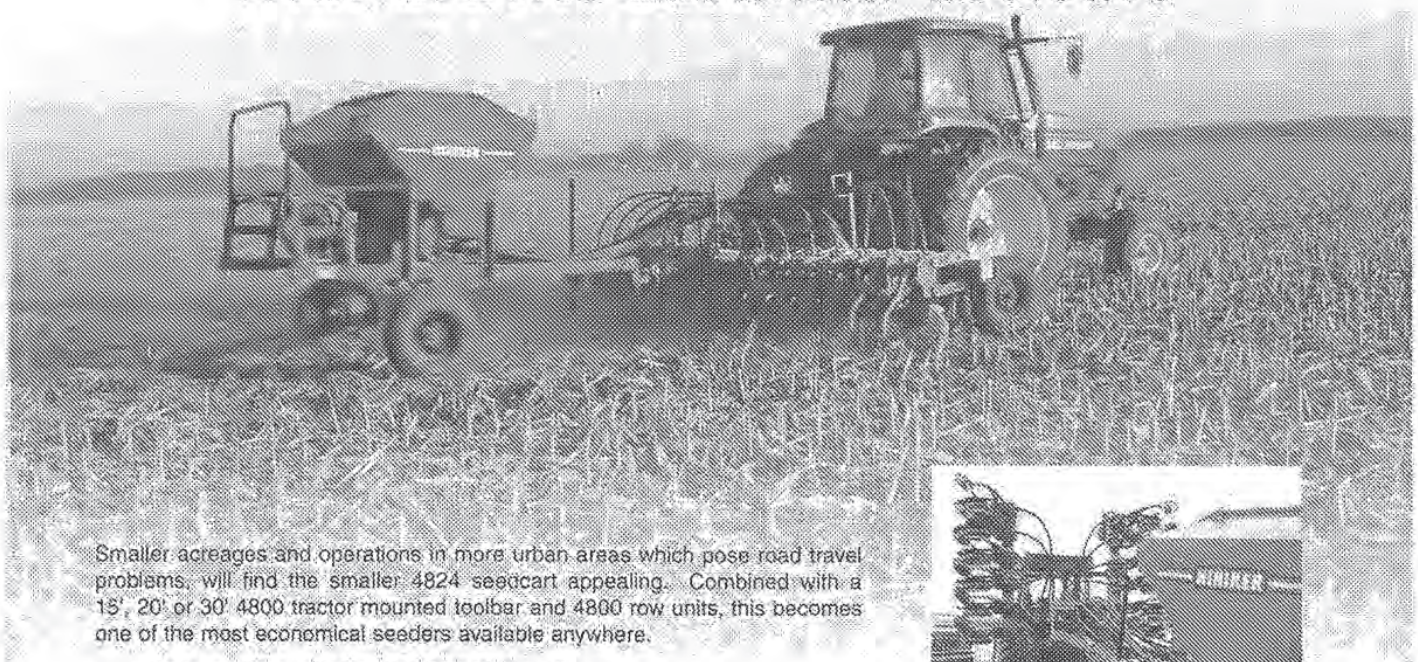
First and foremost is the unique gauge wheel/single disc opener/seed presser/rotary closer configuration. These combined components provide excellent depth control and seed-to-soil contact, along with positive, thorough covering and closing, without packing the soil over the seed. This eliminates the germination-impairing crusting that can occur in soil compacted by the press-wheels or packing wheels found on most grain drills and corn planters.

HINIKER PARALLEL LINKAGE	SINGLE ARM DRILL
	
	

Secondly, in order to work effectively each of these components needs to remain in full contact with the soil surface at all times. Hiniker utilizes a parallel linkage mounting system to keep the ground-engaging seeding and covering components in a level horizontal plane, even as the individual row units move up and down through an 8 inch range in response to surface irregularities.

The illustrations (above) contrast the ability of a Hiniker planter to maintain proper seeding depth and soil coverage with that of drills which use only a single radial mounting arm.

4824 SEEDCART
With Tractor Mounted Toolbars



Smaller acreages and operations in more urban areas which pose road travel problems, will find the smaller 4824 seedcart appealing. Combined with a 15', 20' or 30' 4800 tractor mounted toolbar and 4800 row units, this becomes one of the most economical seeders available anywhere.

- **60 Bushel Seed Capacity (100 Optional).**
- **15' & 20' Non Folding, 20' & 30' Folding Toolbars.**
- **10" Or 15" Row Spacing Option On Non Folding 15' & 20' Models.**

The 20' vertical fold is ideal for road travel, folding to only 11' 2" transport width.

AIR SEEDER & SEEDCART
Specifications

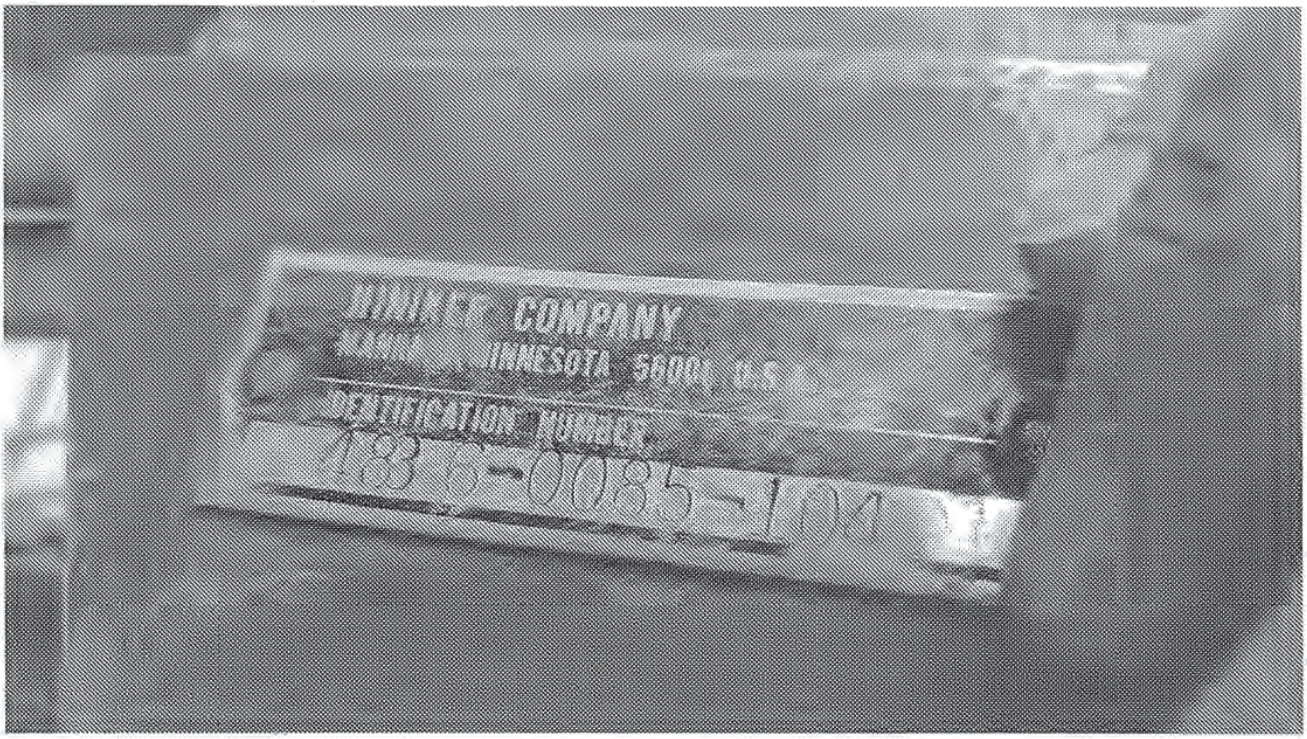
MODEL	TOOLBAR	# ROWS	ROW WIDTH	TRANSPORT	HOPPER BU	WEIGHT W/CART
4858	15' Rigid	18	10"	15' 8"	60	5,959
4859	15' Rigid	12	15"	15' 8"	60	4,993
4861	20' Rigid	24	10"	20' 8"	60	7,026
4862	20' Rigid	16	15"	20' 8"	60	5,738
4863	20' Vert Fold	16	15"	11' 2"	60	6,377
4864	30' Vert Fold	24	15"	20' 9"	60	7,991
4865	30' Front Fold	24	15"	15' 9"*	130	10,806
4866	30' Front Fold	36	10"	15' 9"*	130	12,734
4867	40' Front Fold	32	15"	15' 9"*	130	12,308
4868	45' Front Fold	36	15"	15' 9"	130	13,620

* 13' 6" with closer arms manually locked upright.

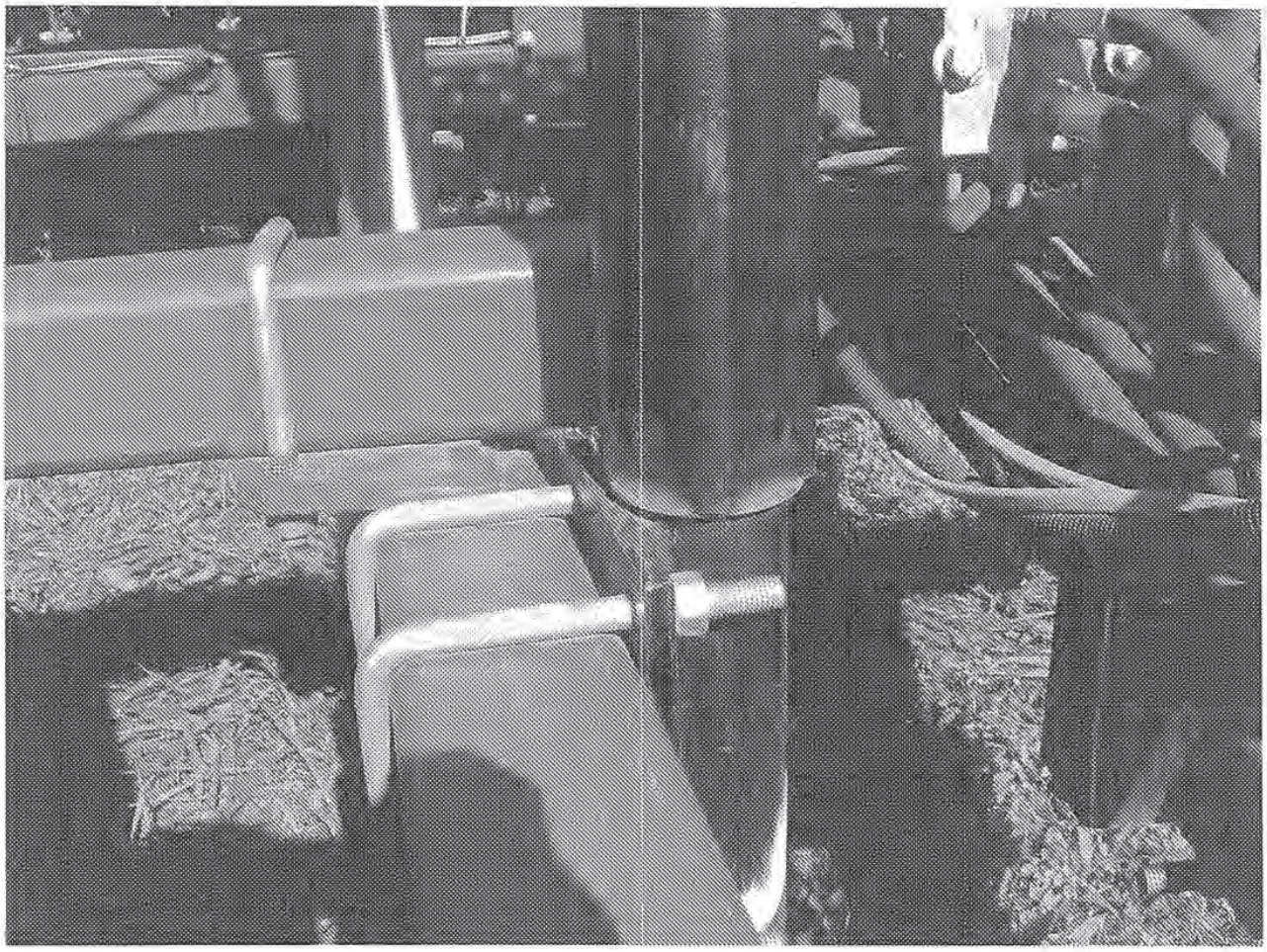
HINIKER

HINIKER COMPANY
58766 240 St. • P.O. Box 3407
Mankato, MN 56002-3407
Phone (507) 625-6621
Fax (507) 625-5883
www.hiniker.com

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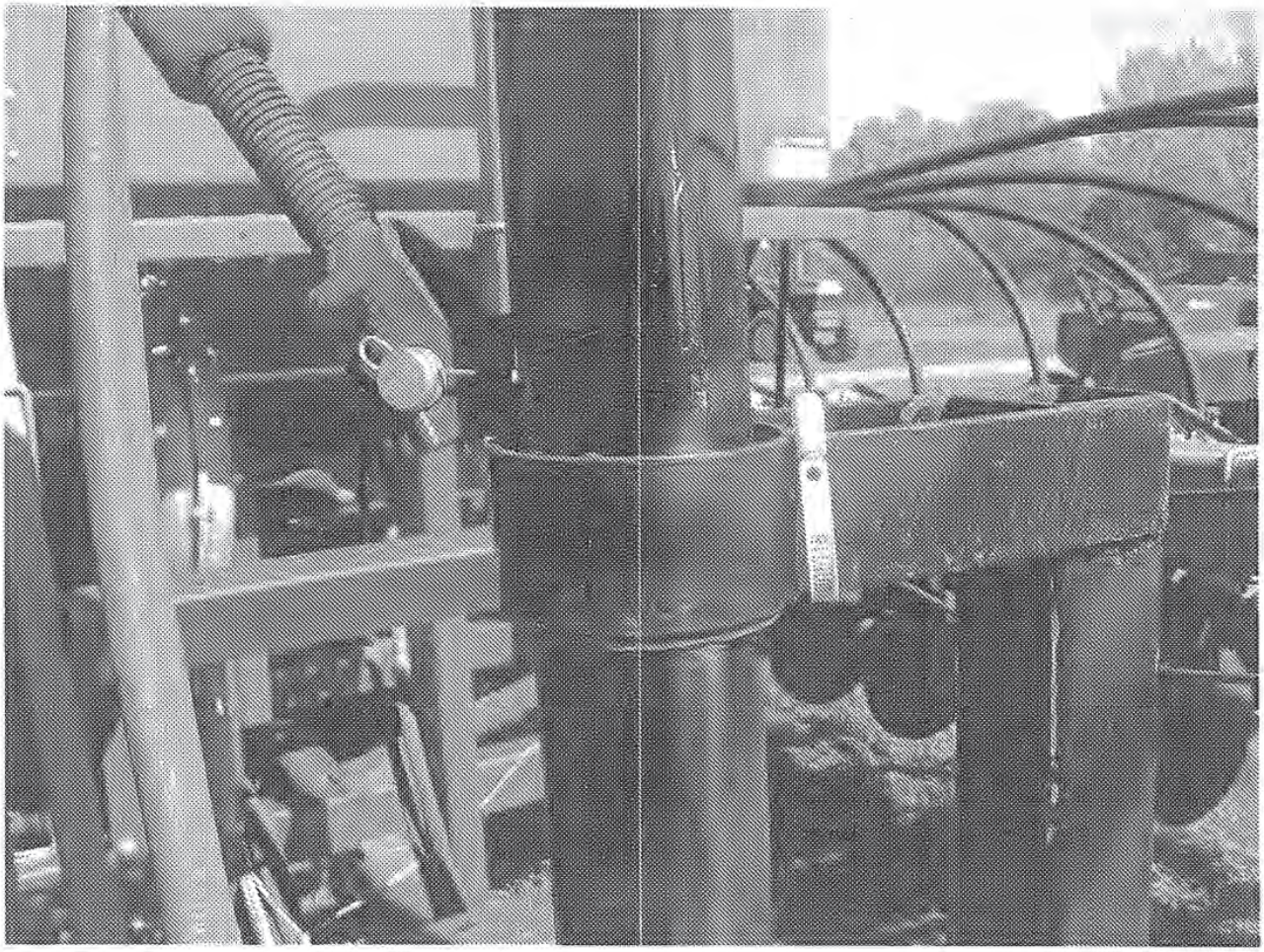
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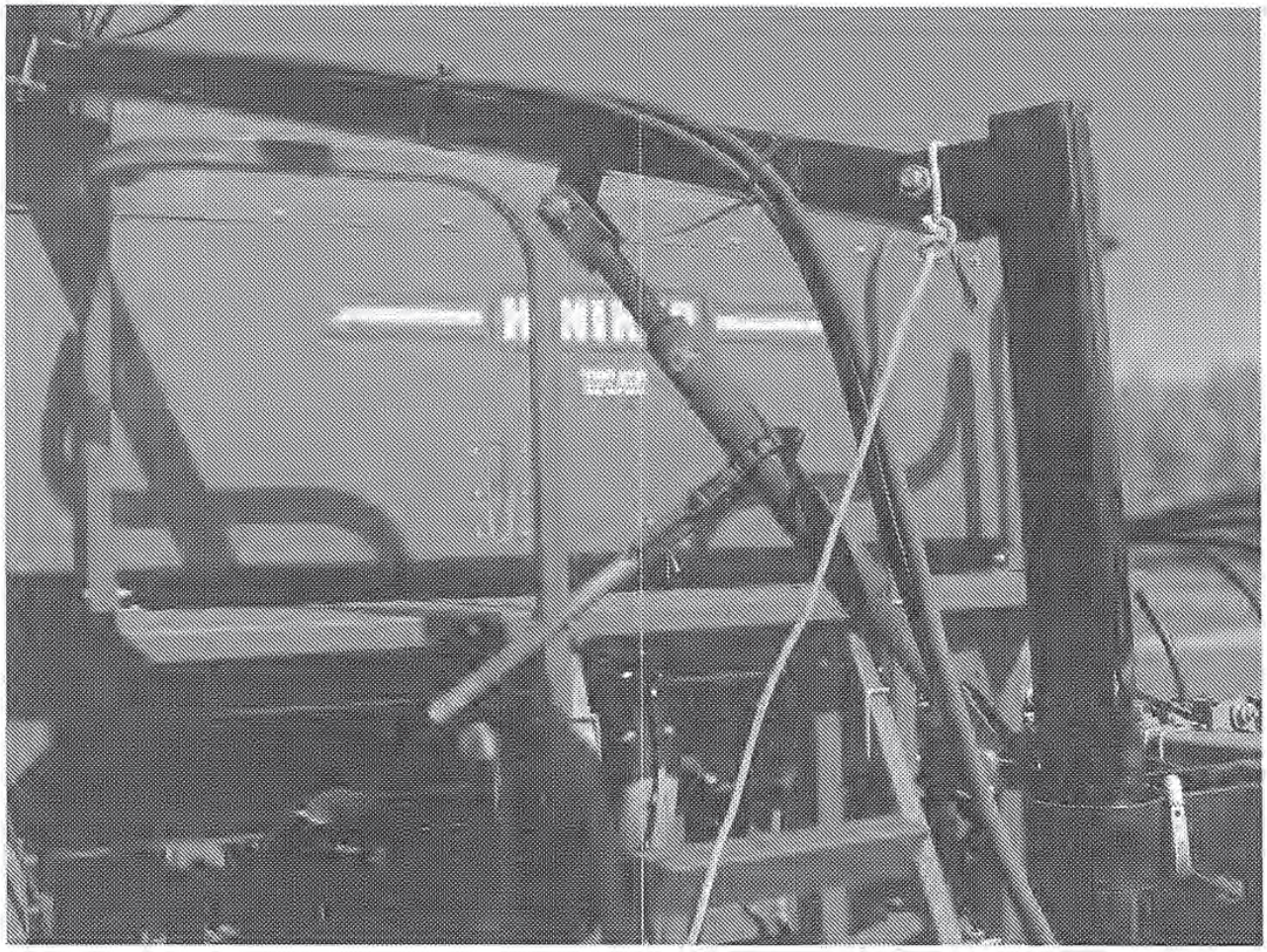
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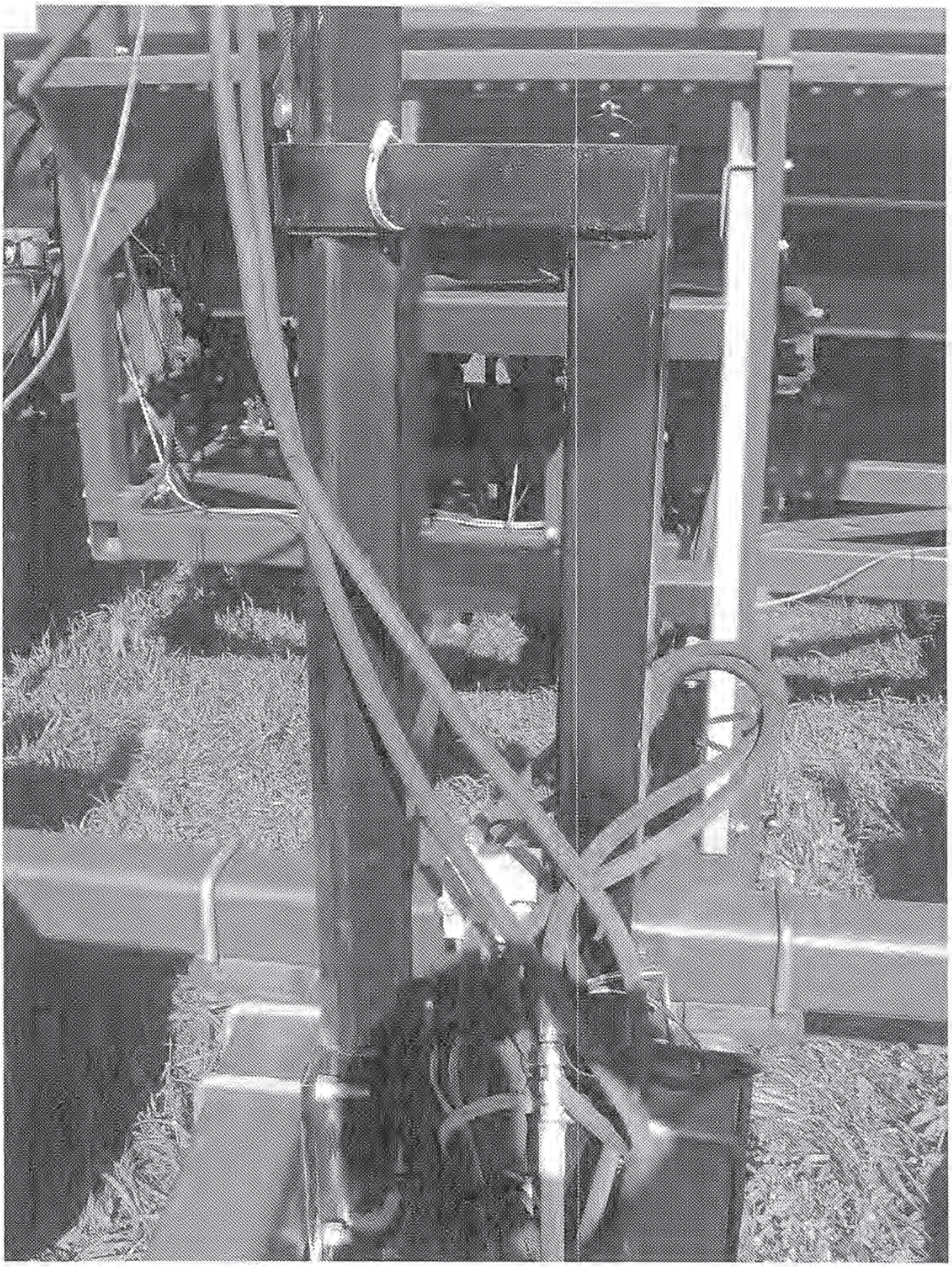
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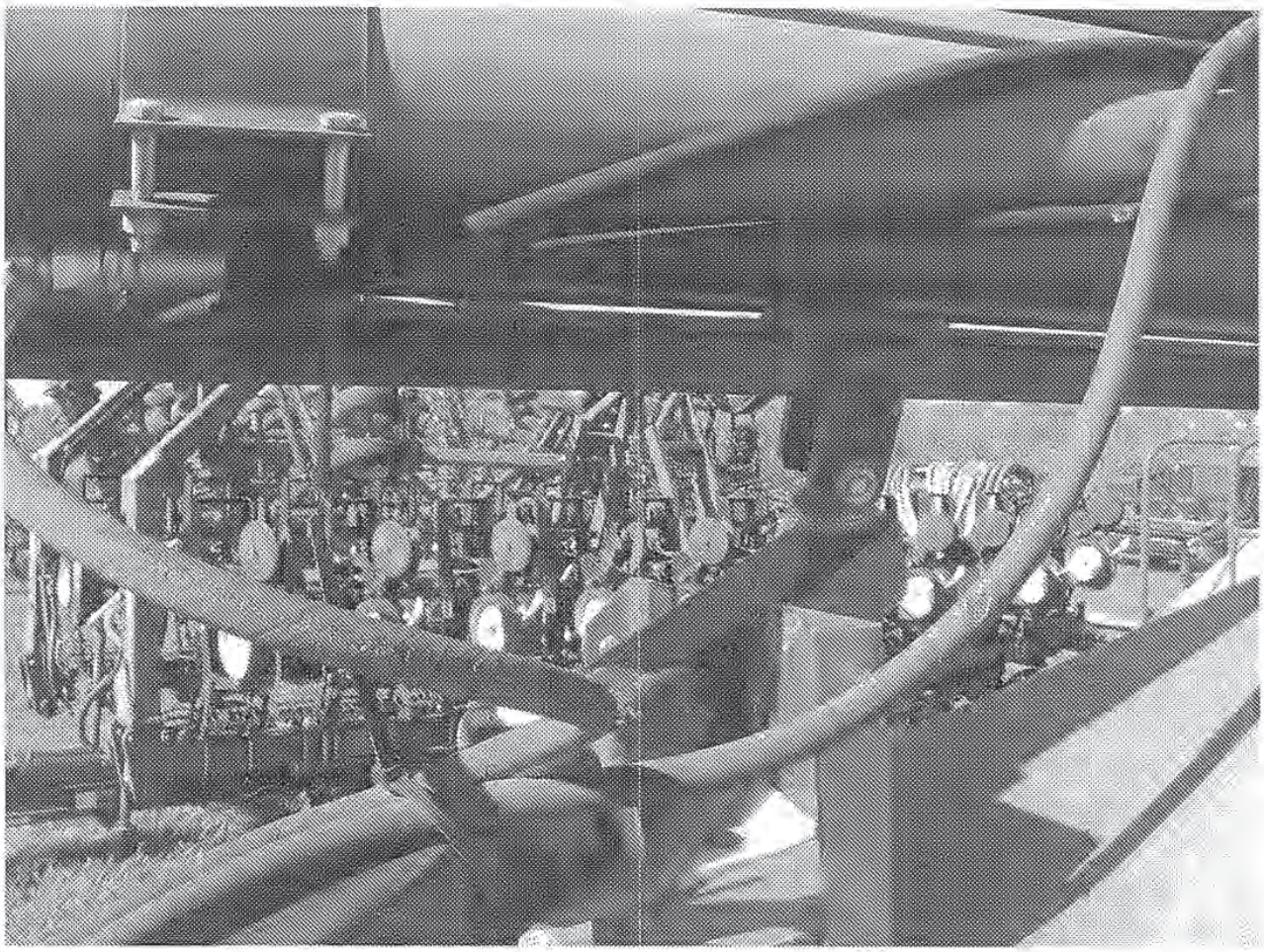
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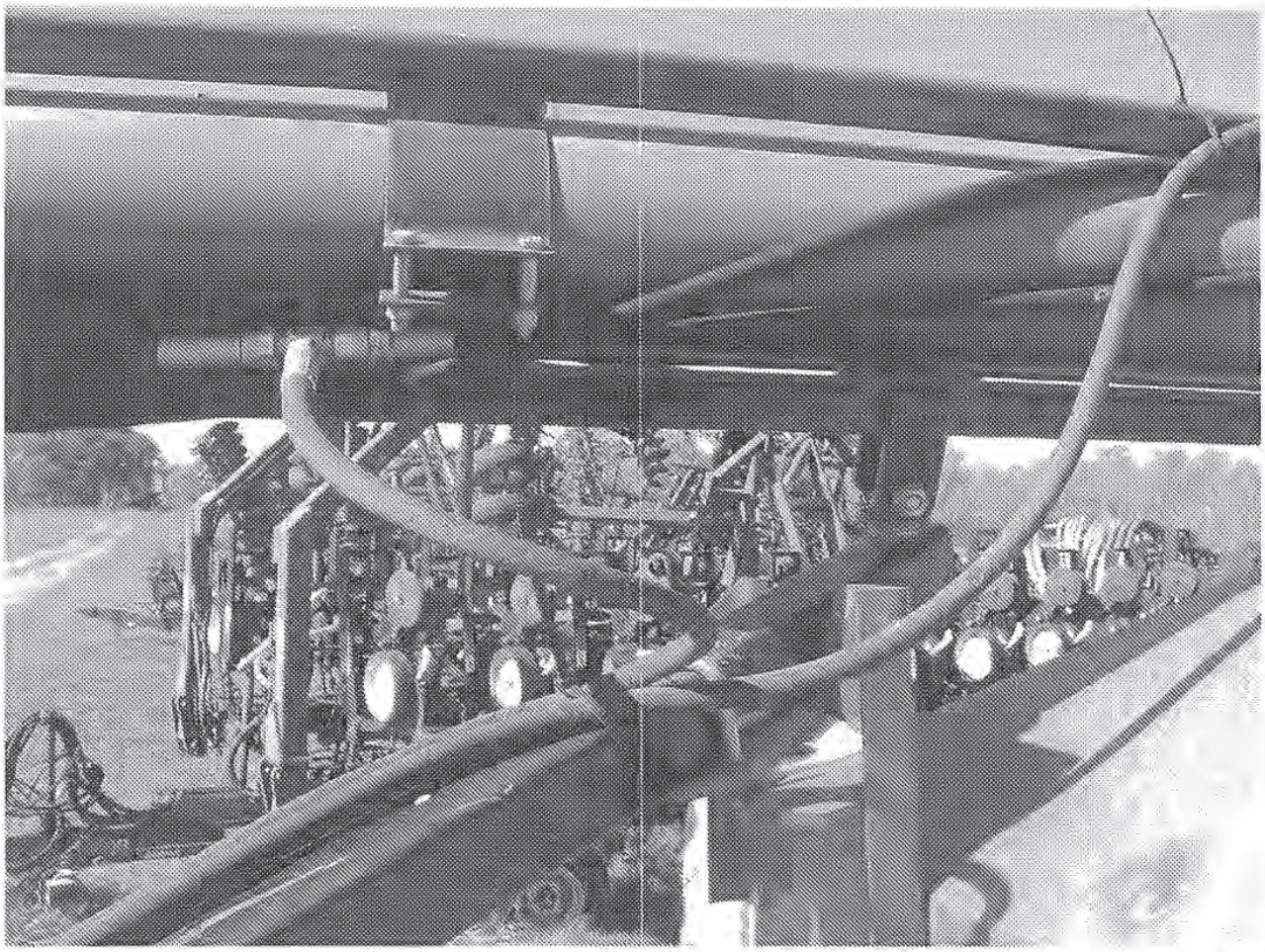
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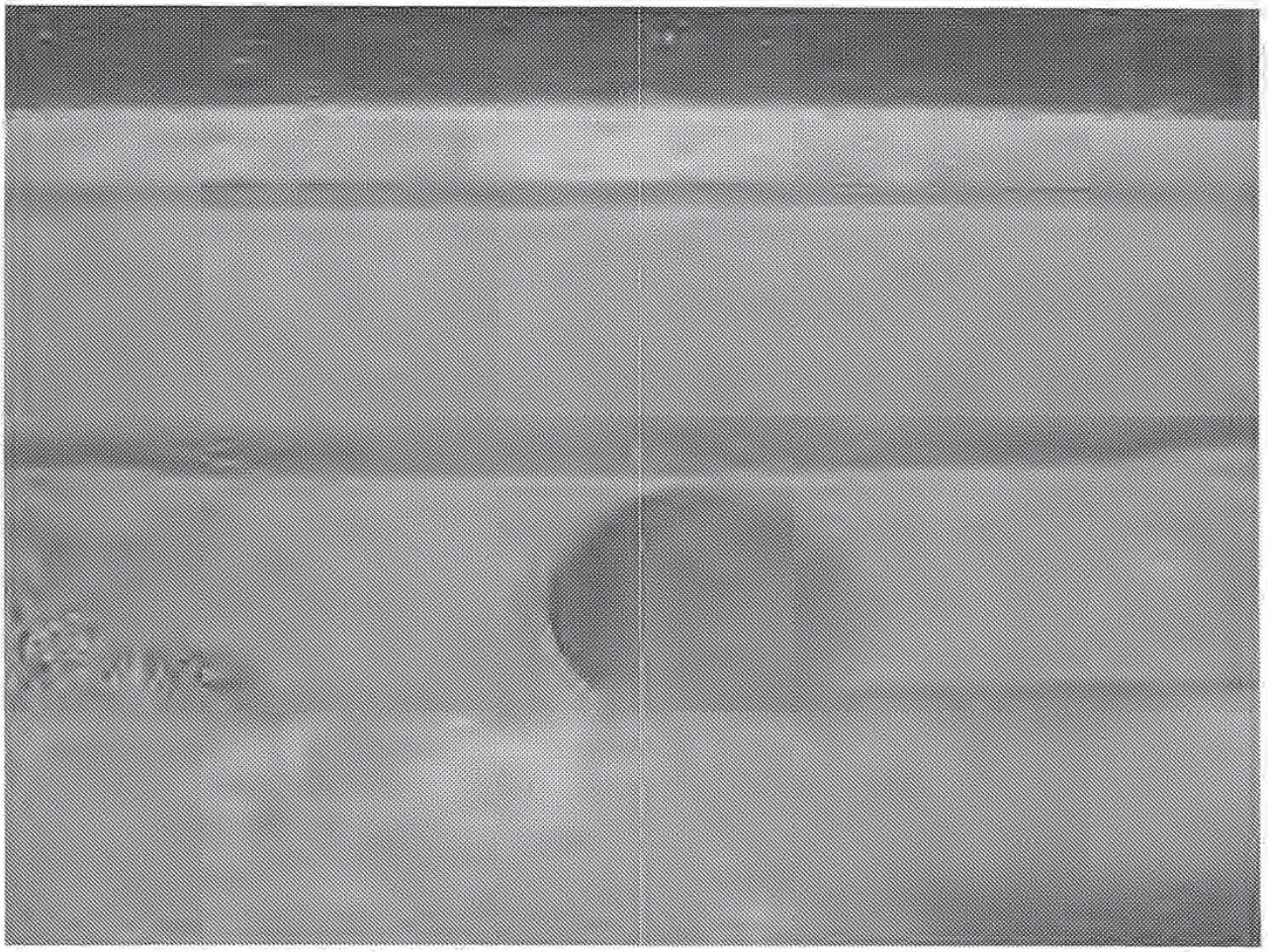
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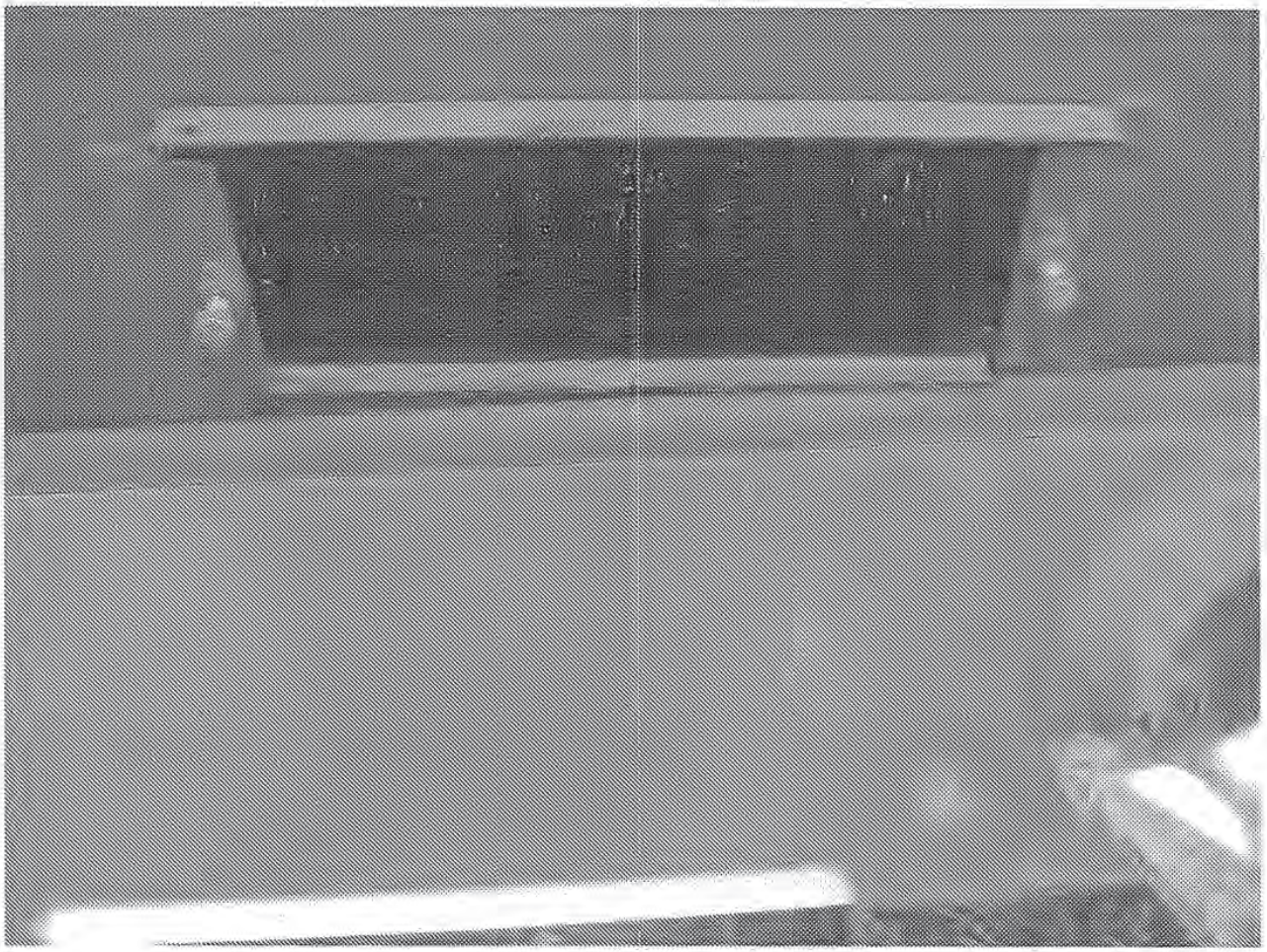
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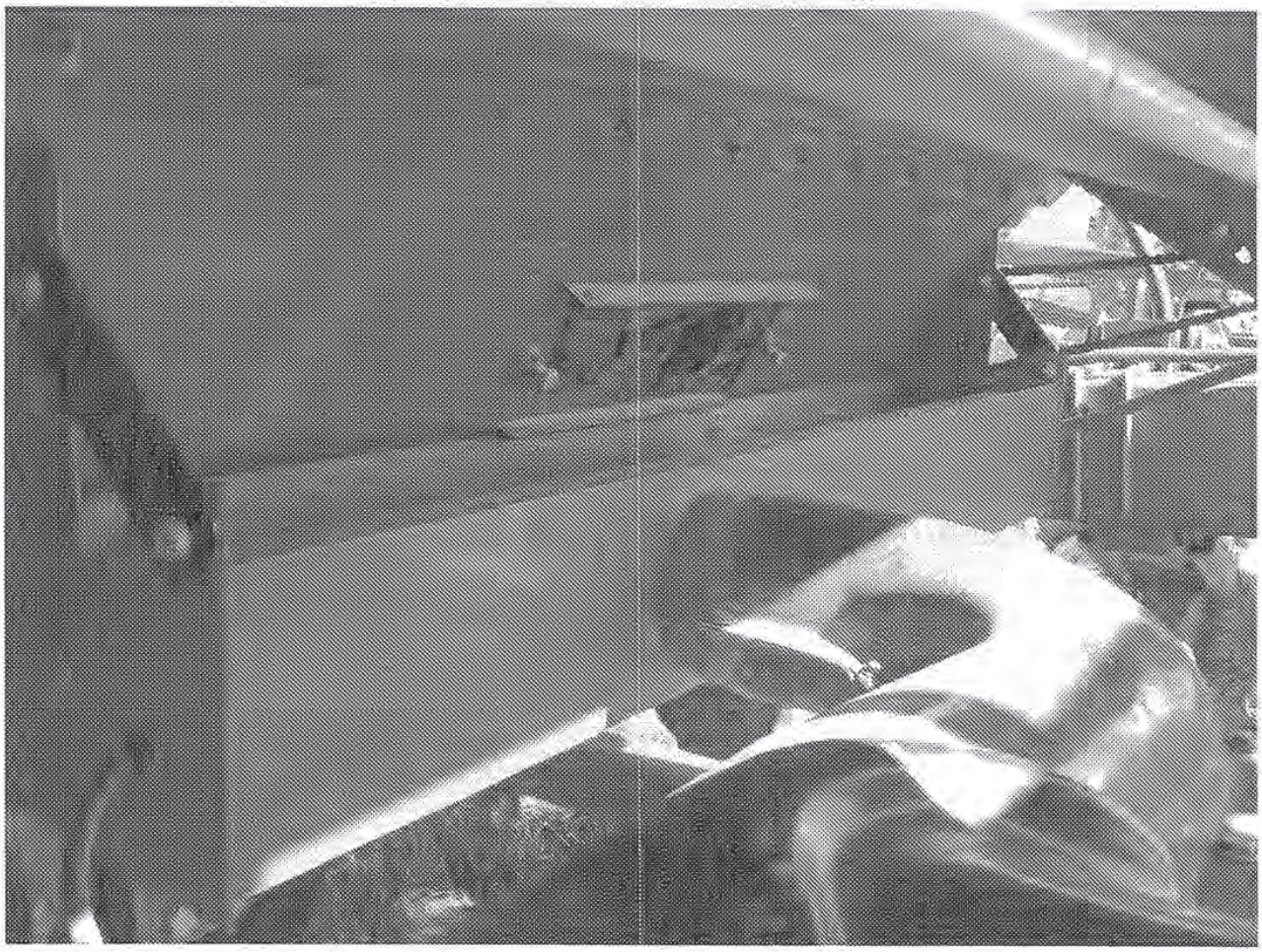
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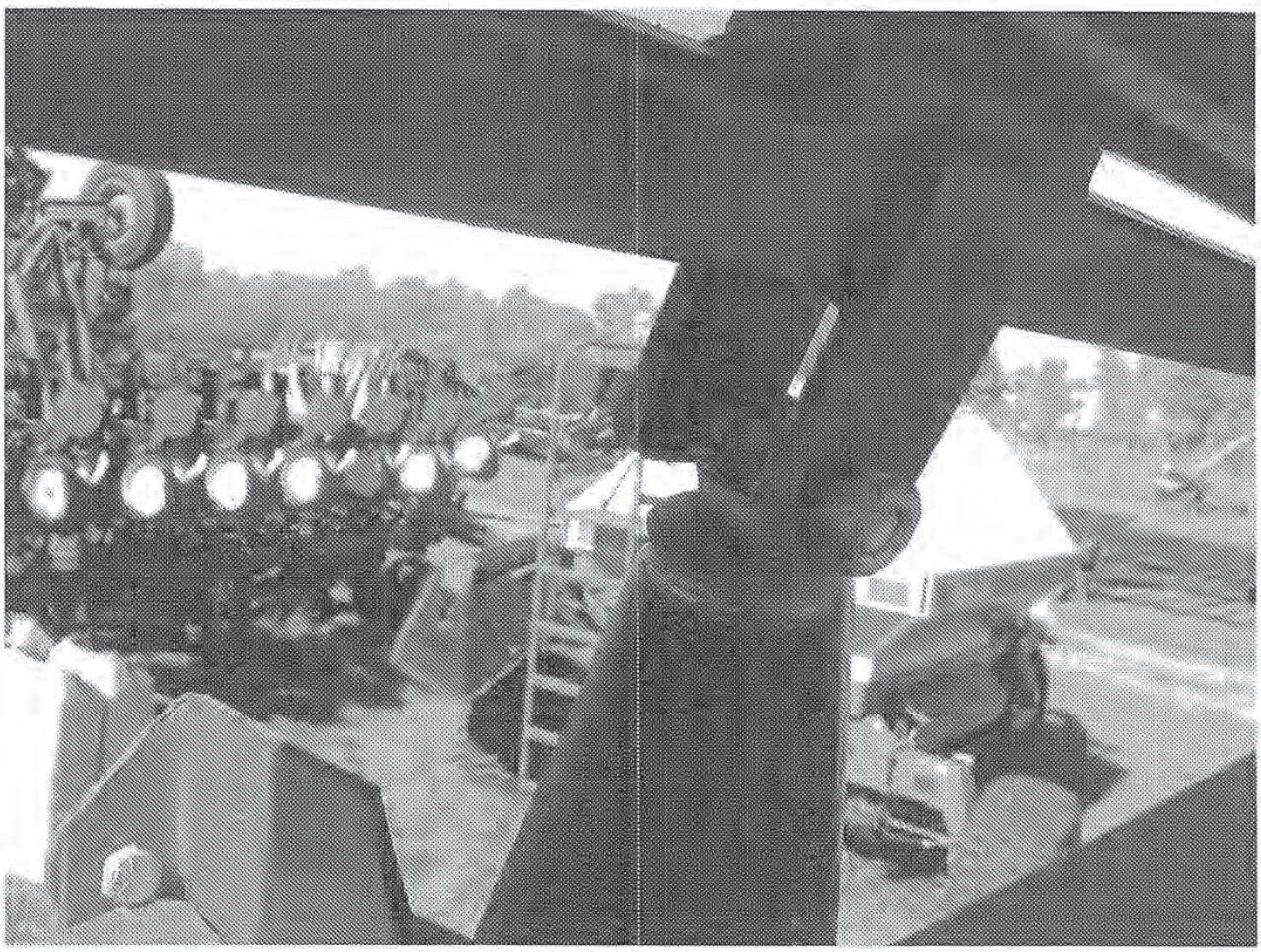
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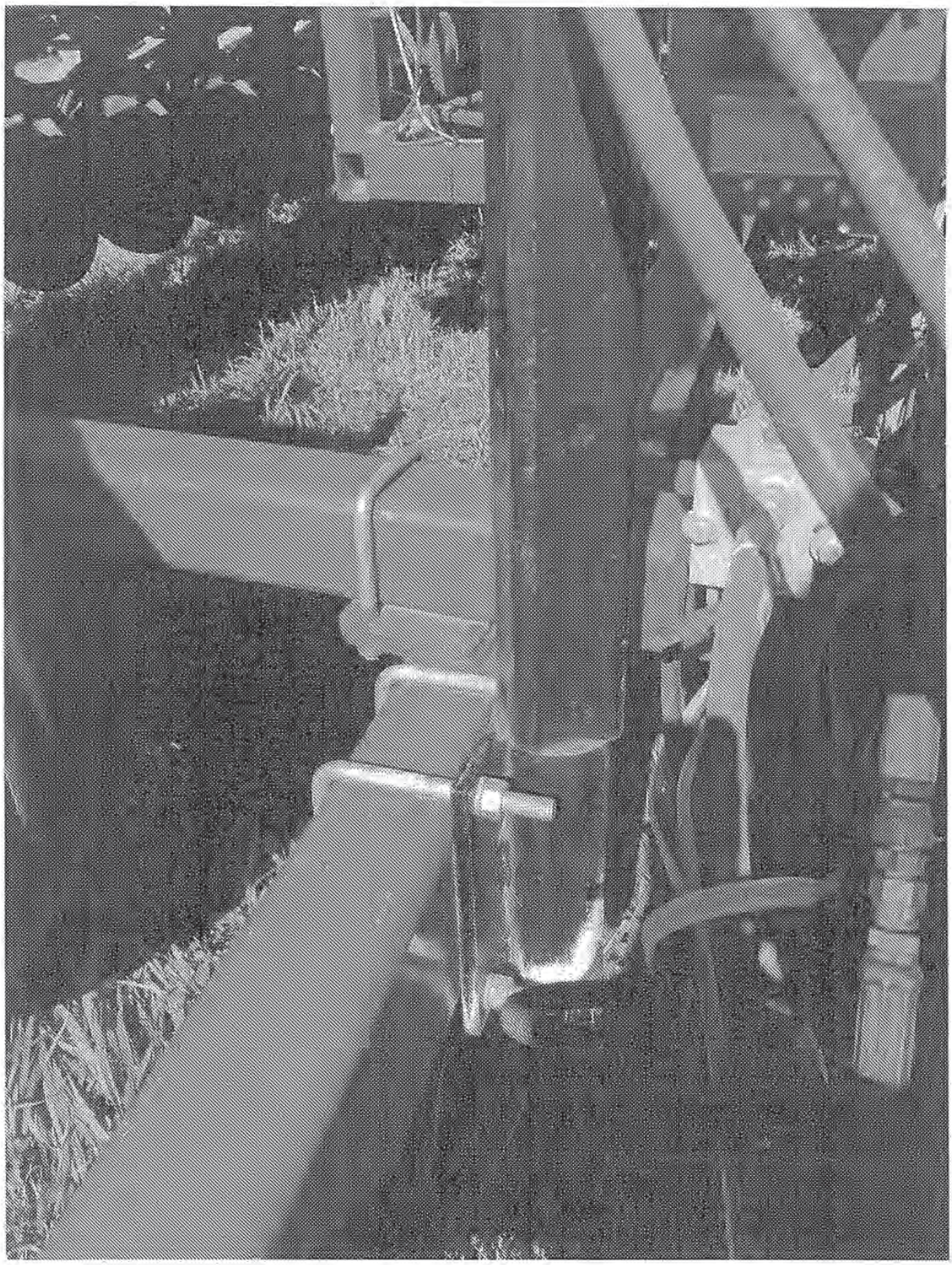
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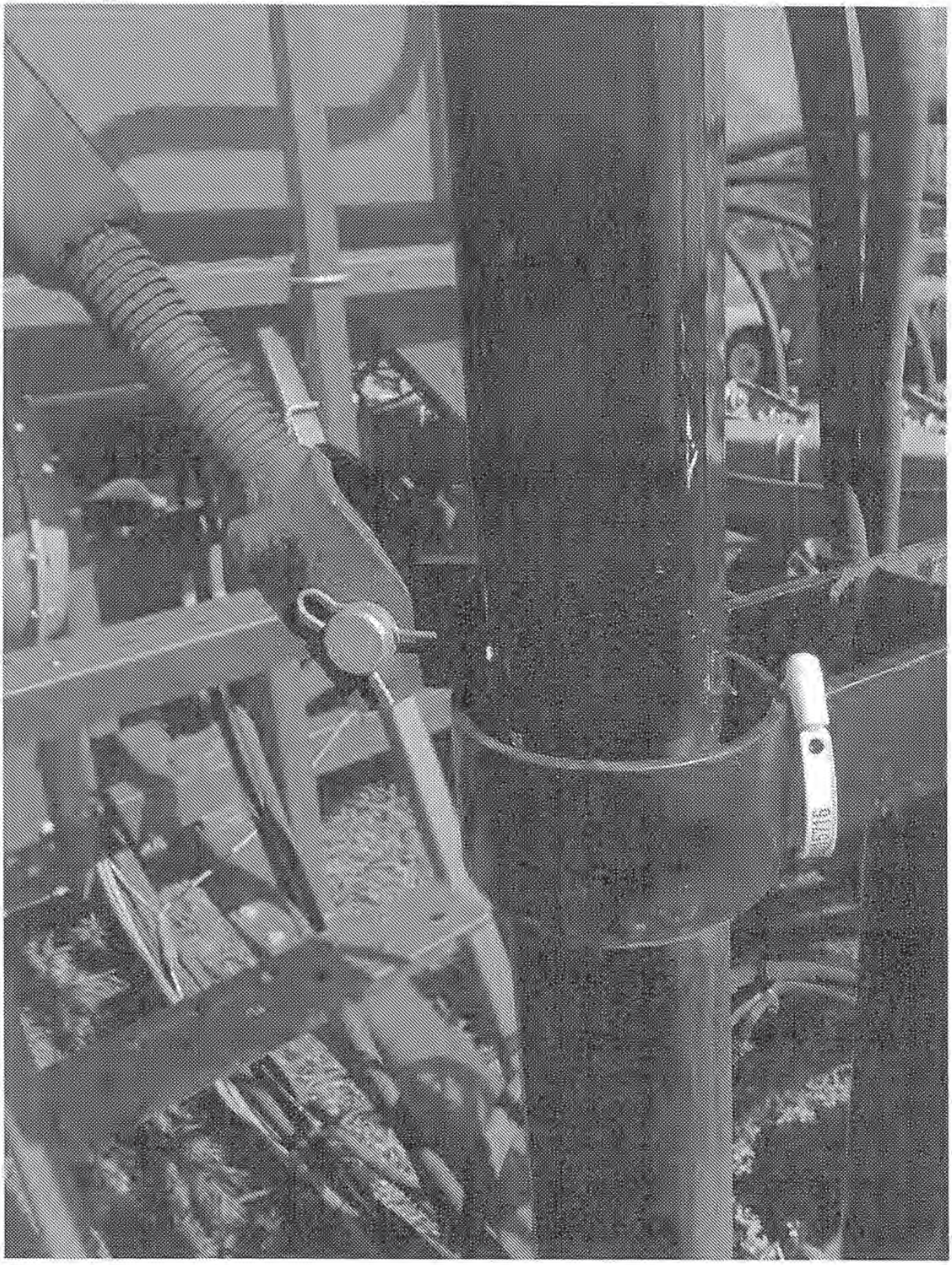
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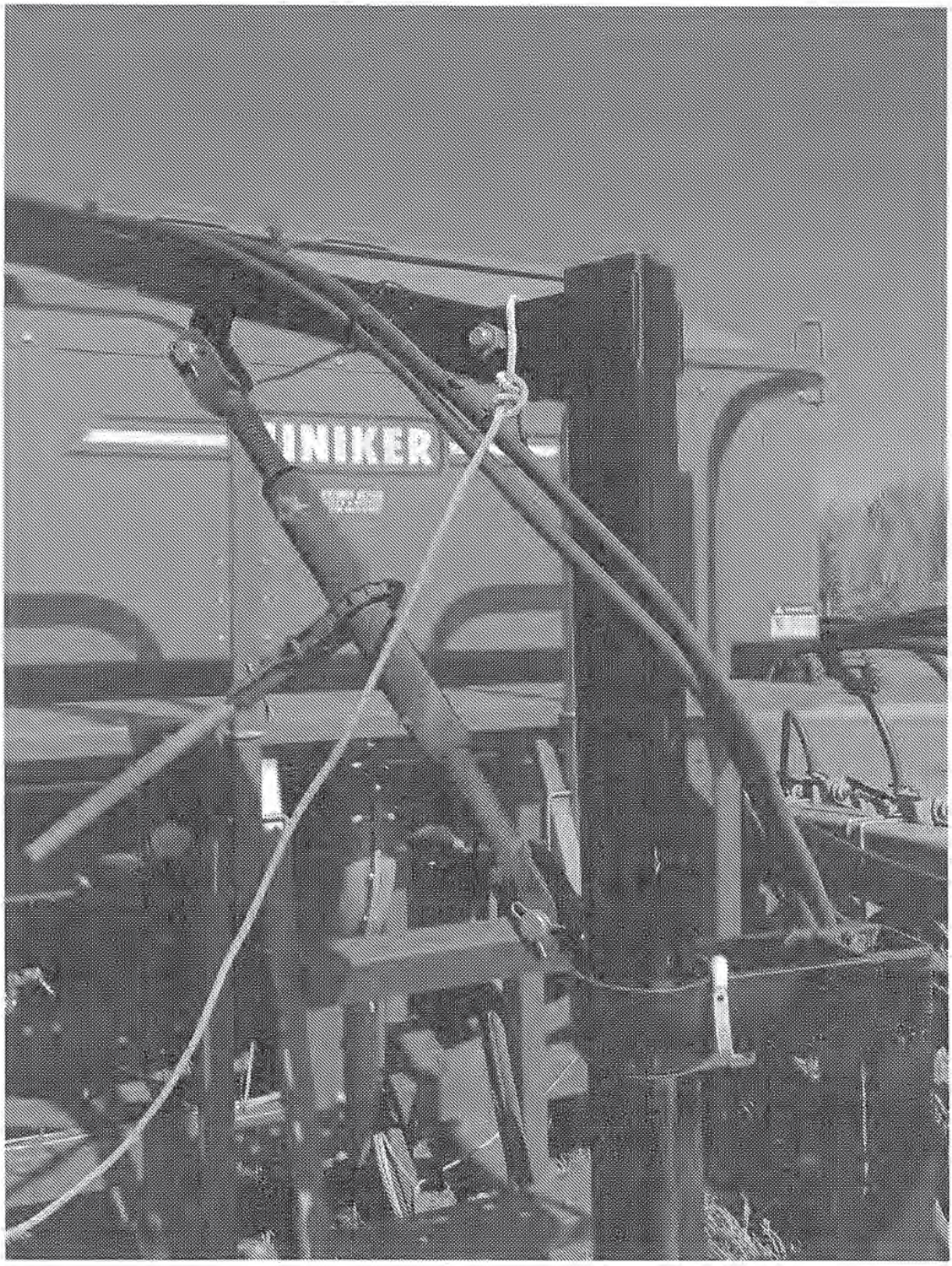
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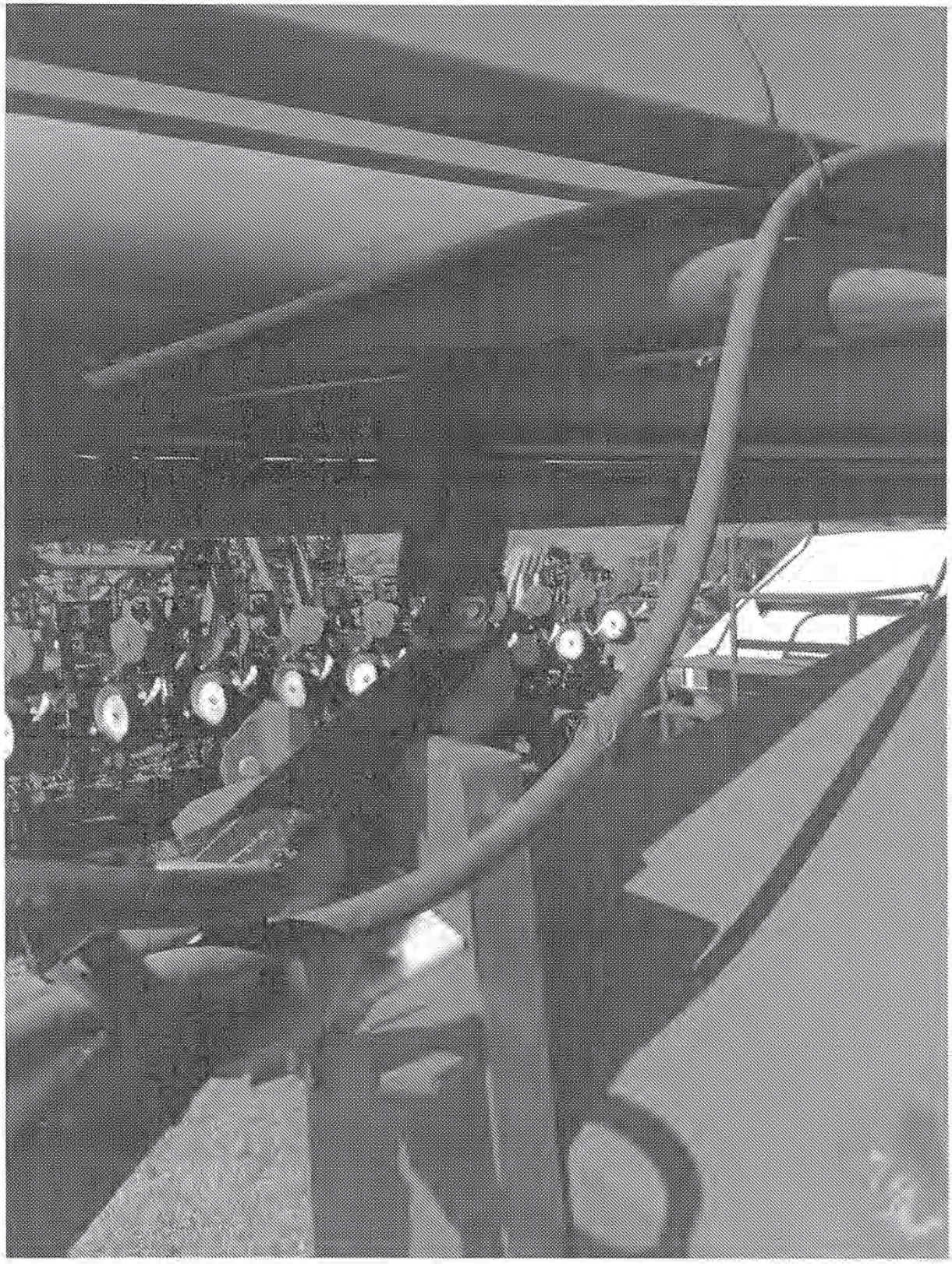
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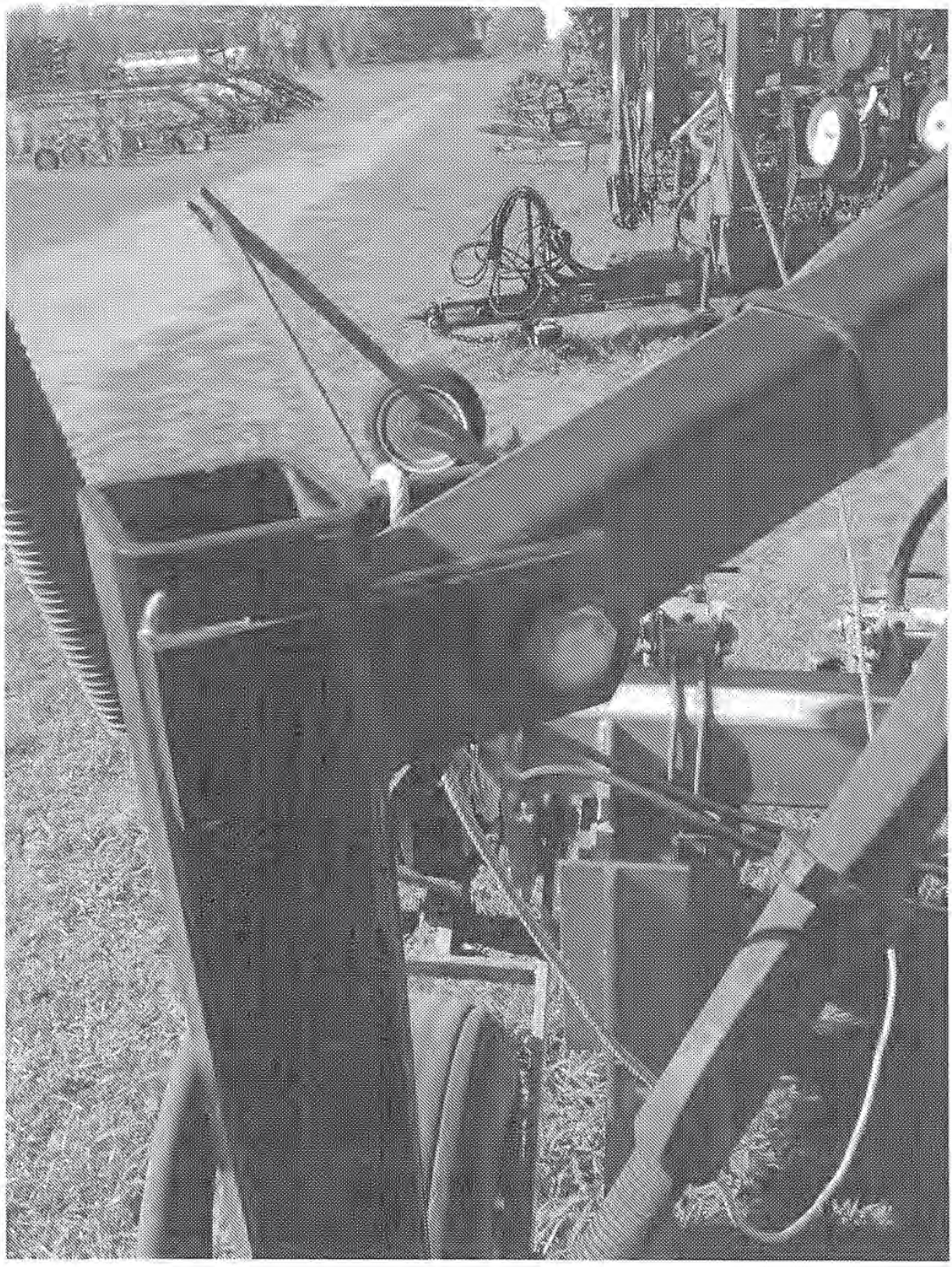
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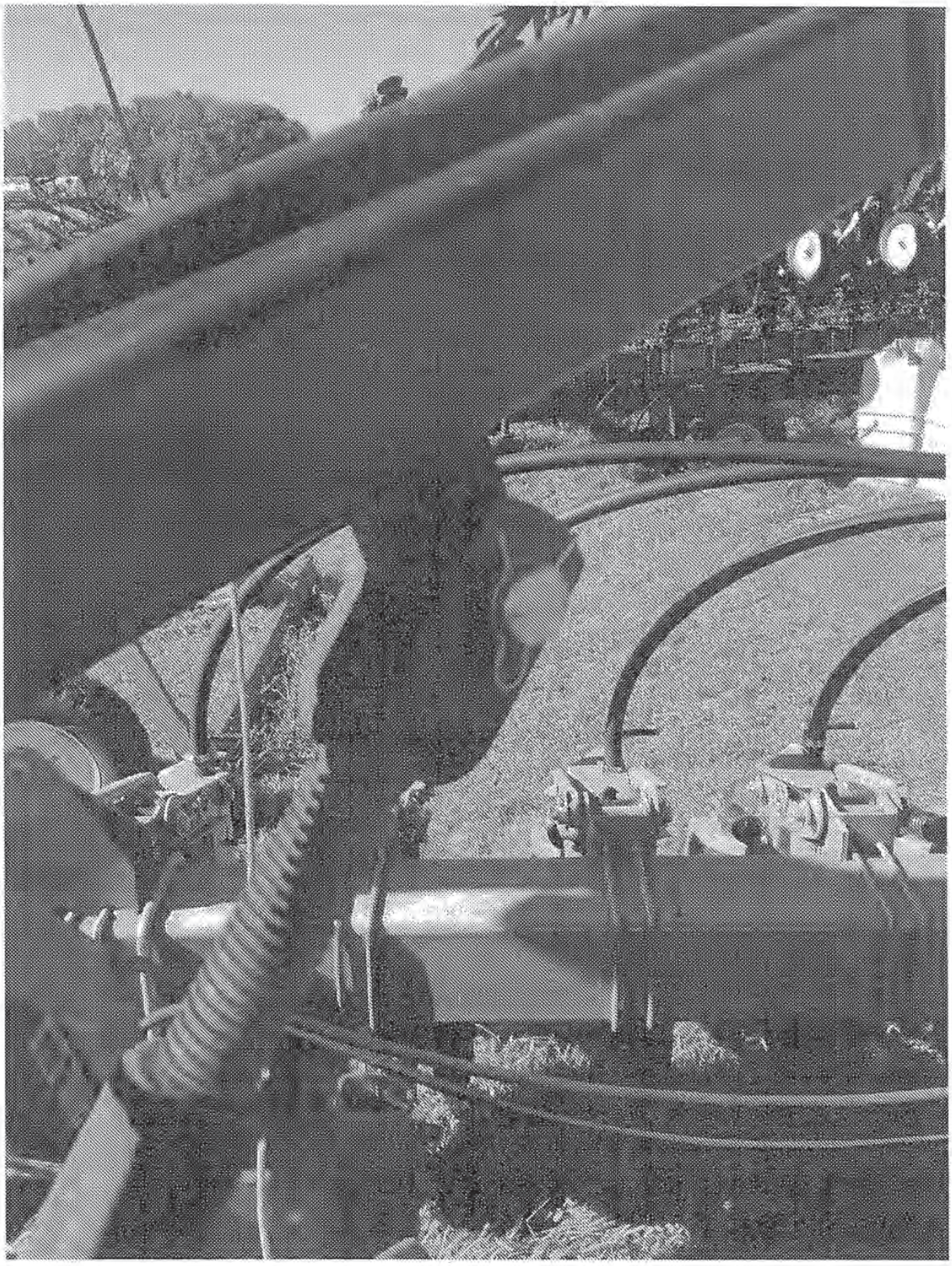
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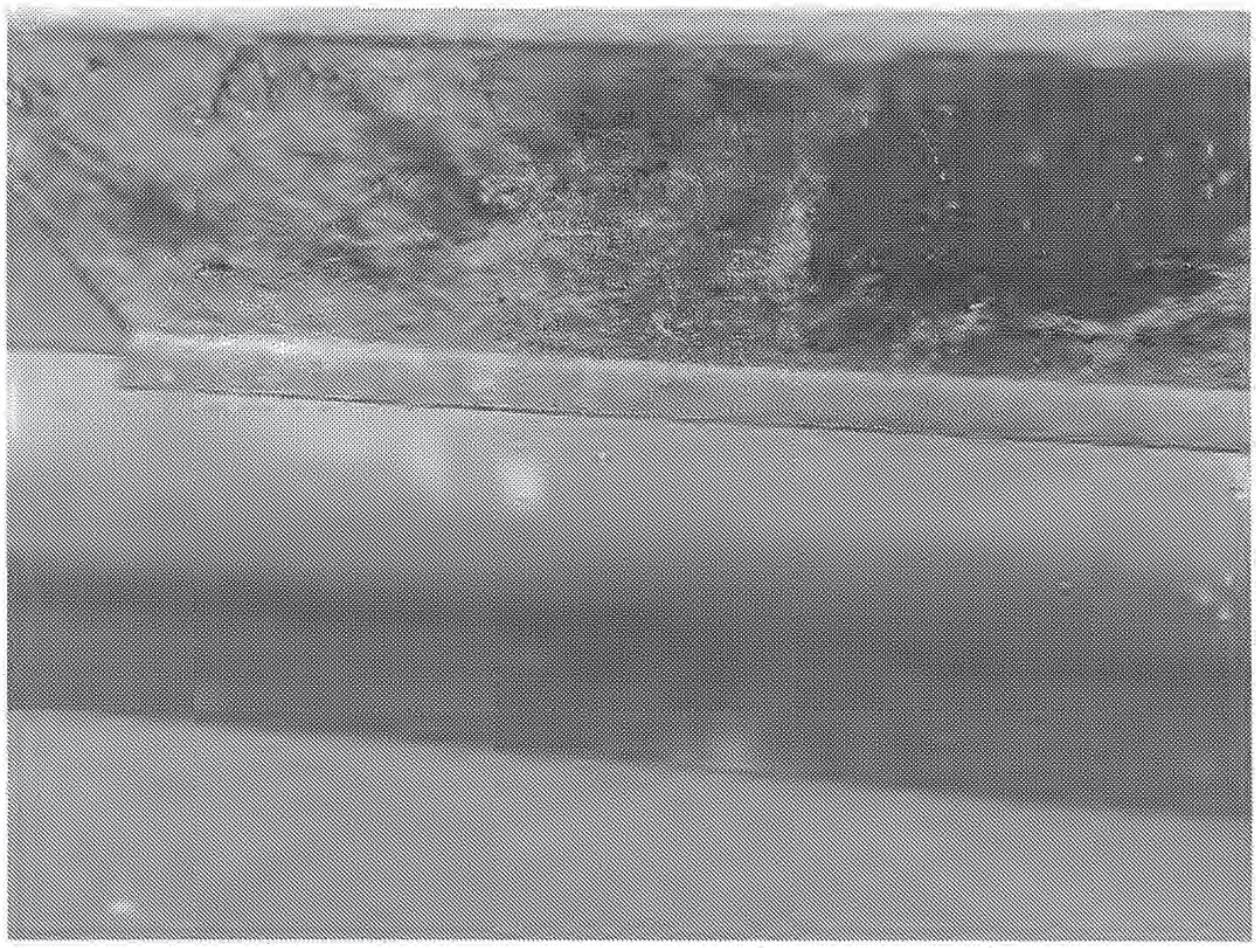
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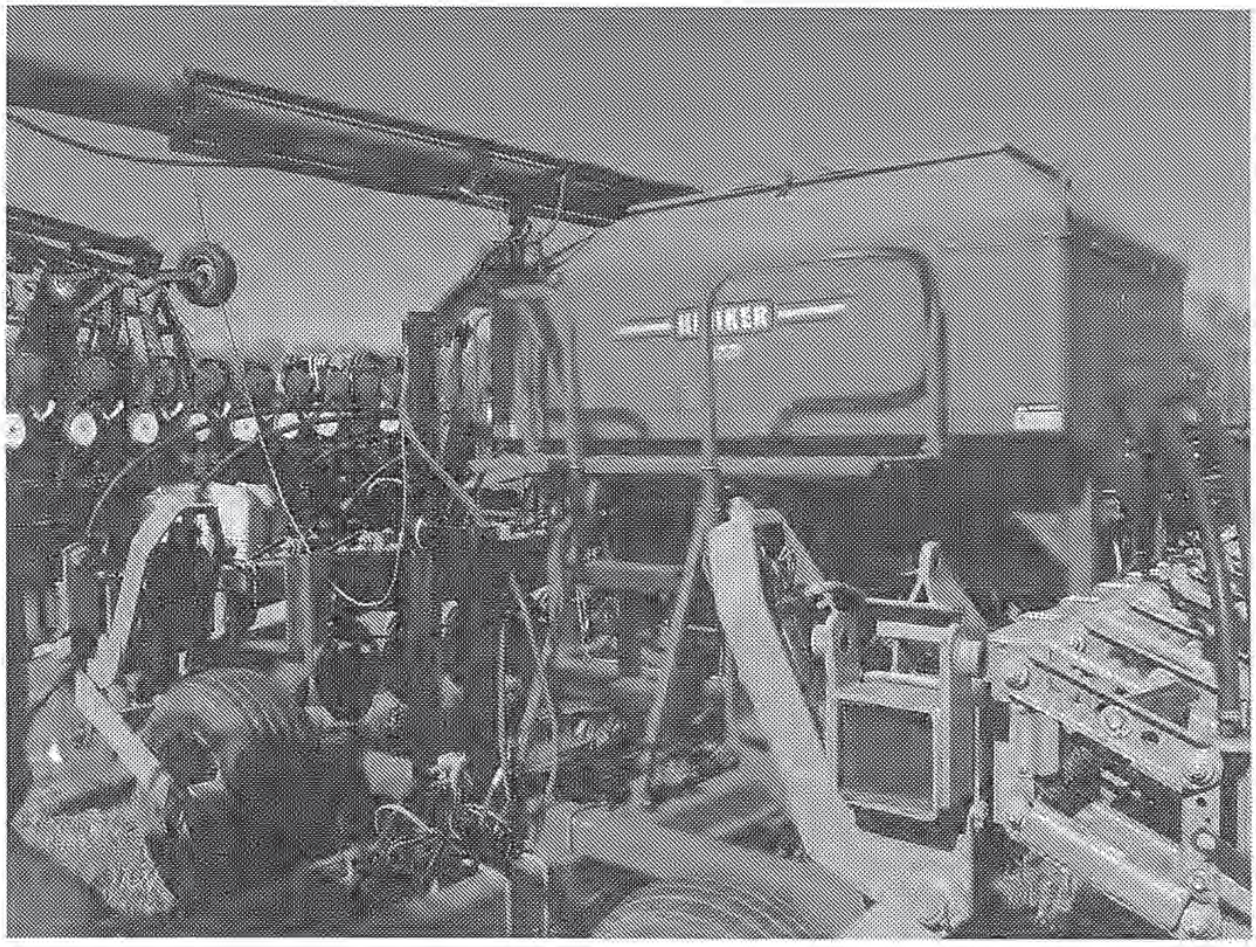
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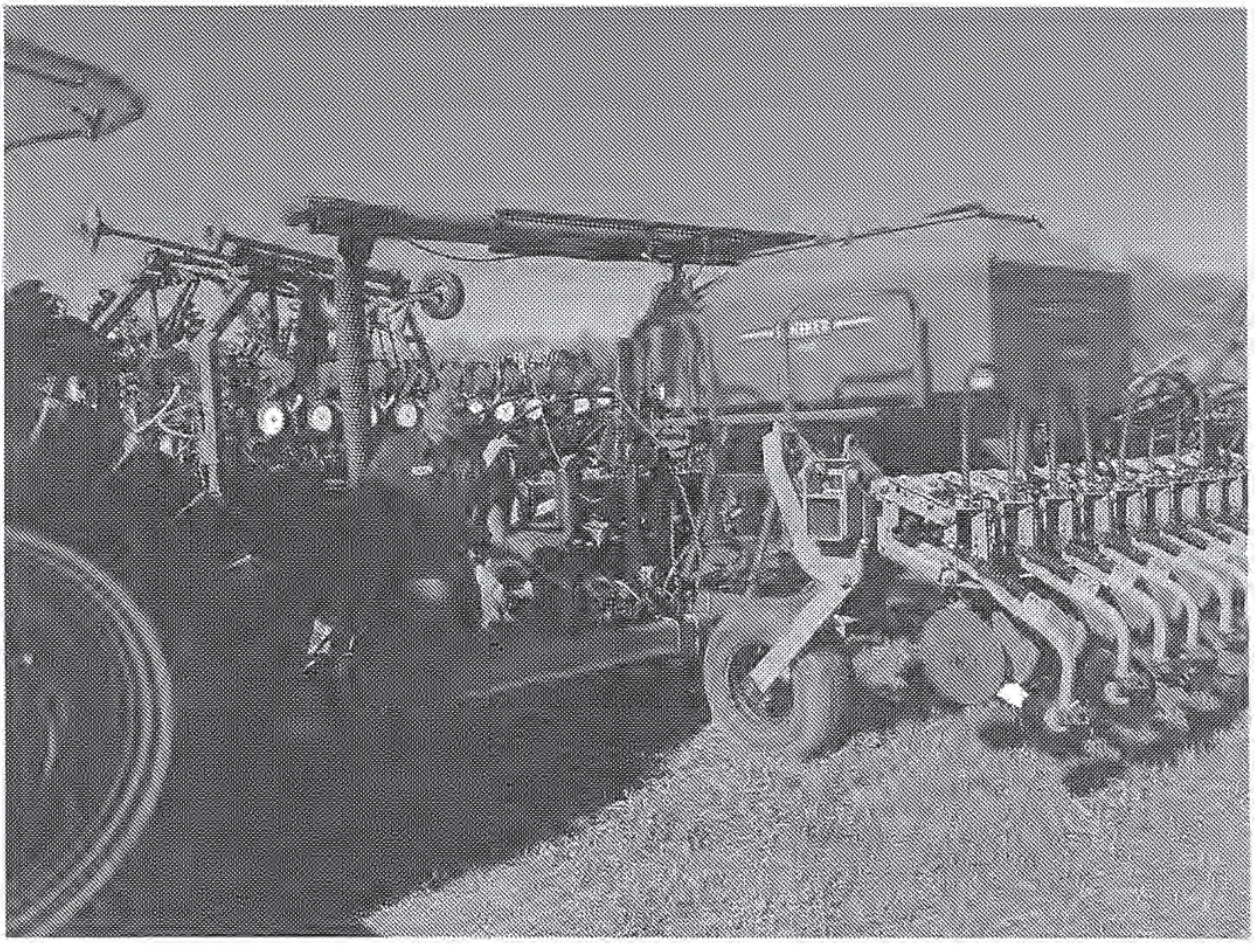
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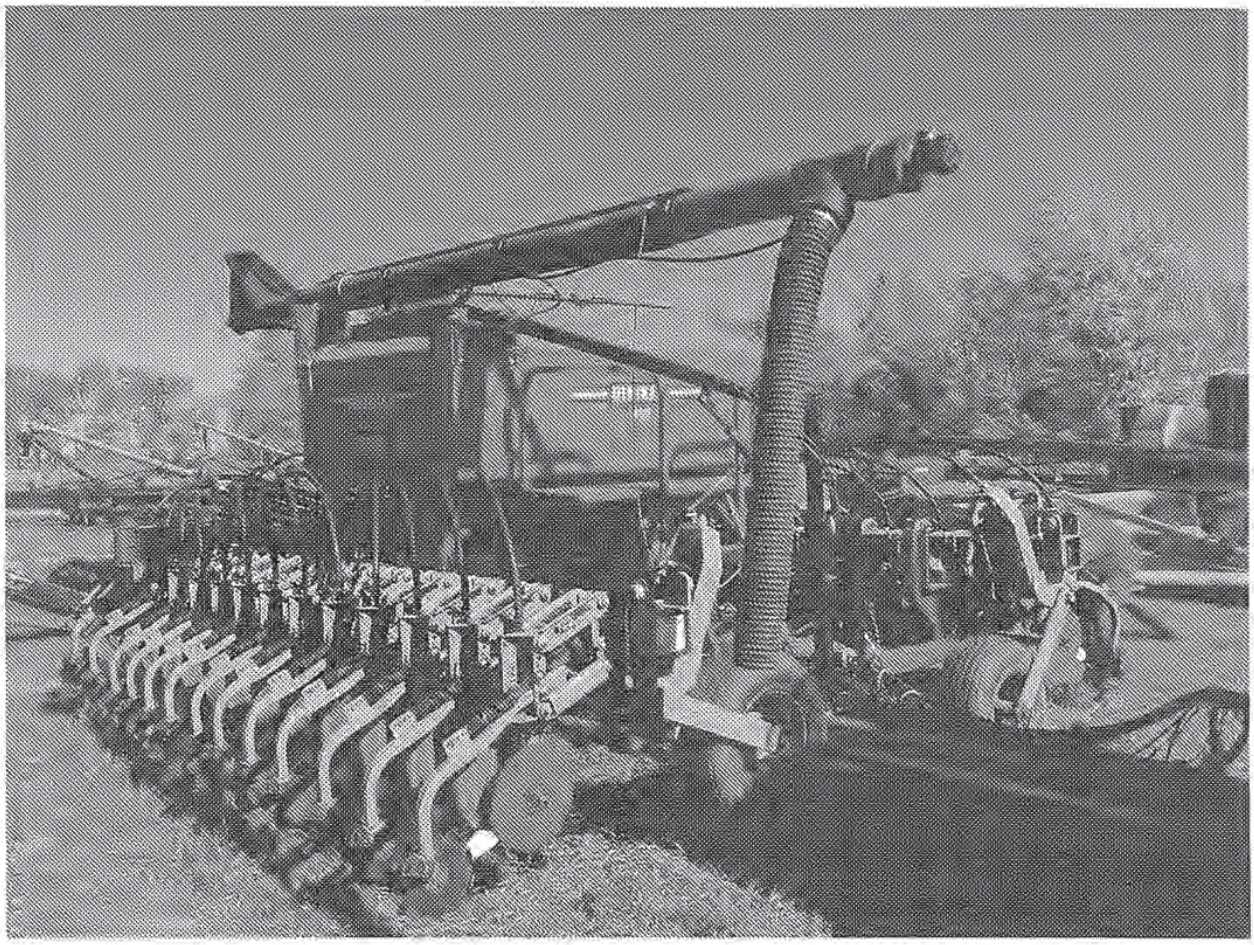
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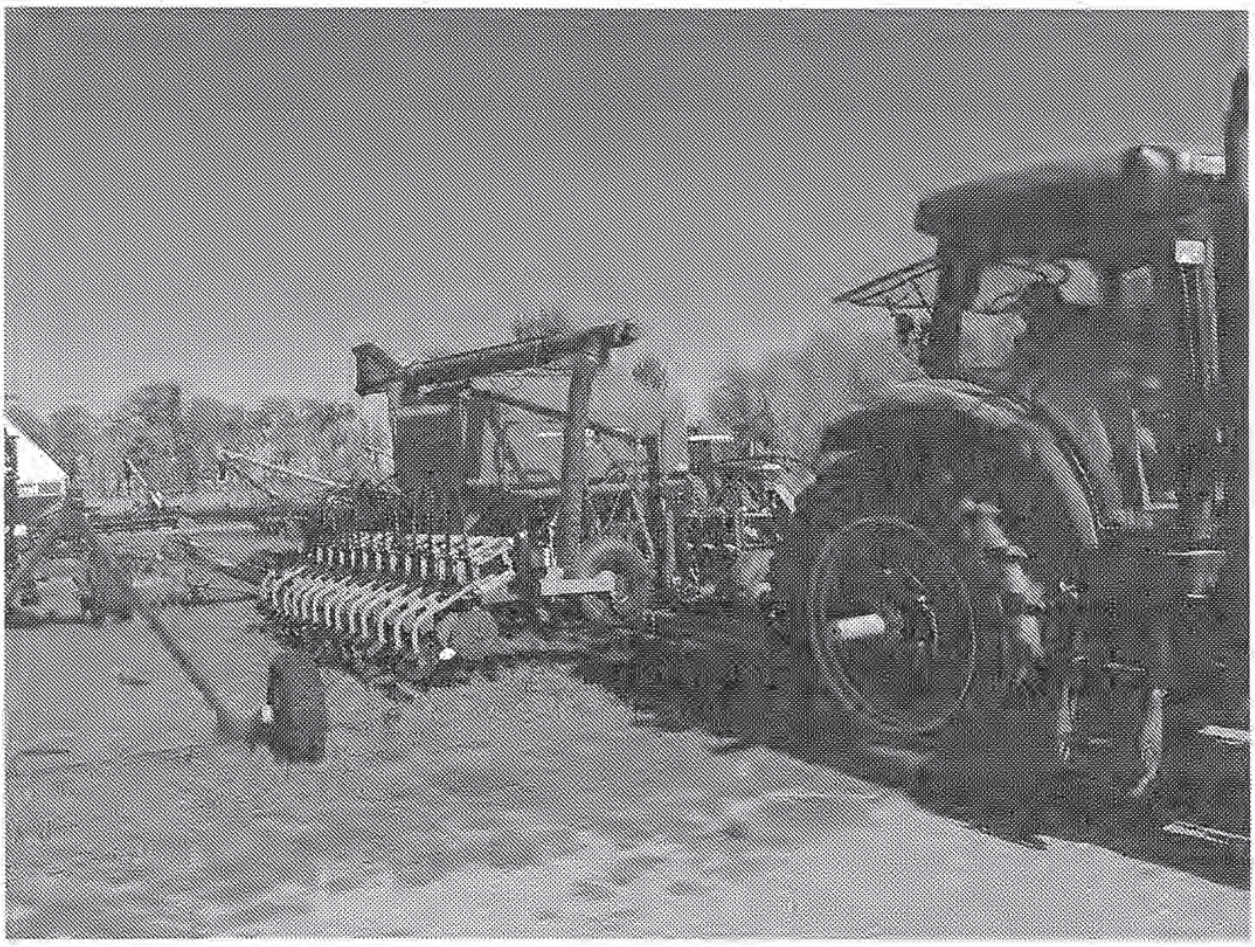
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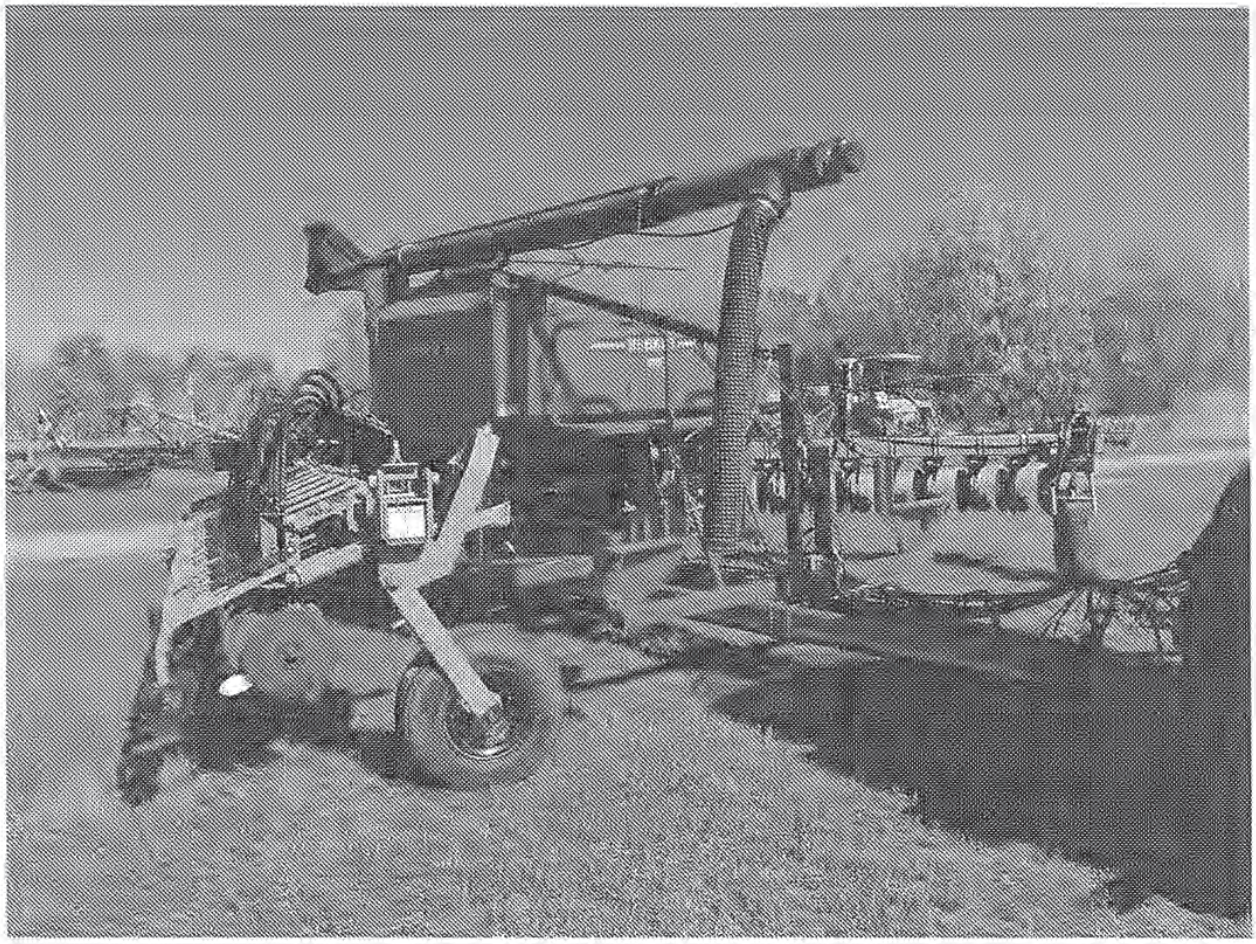
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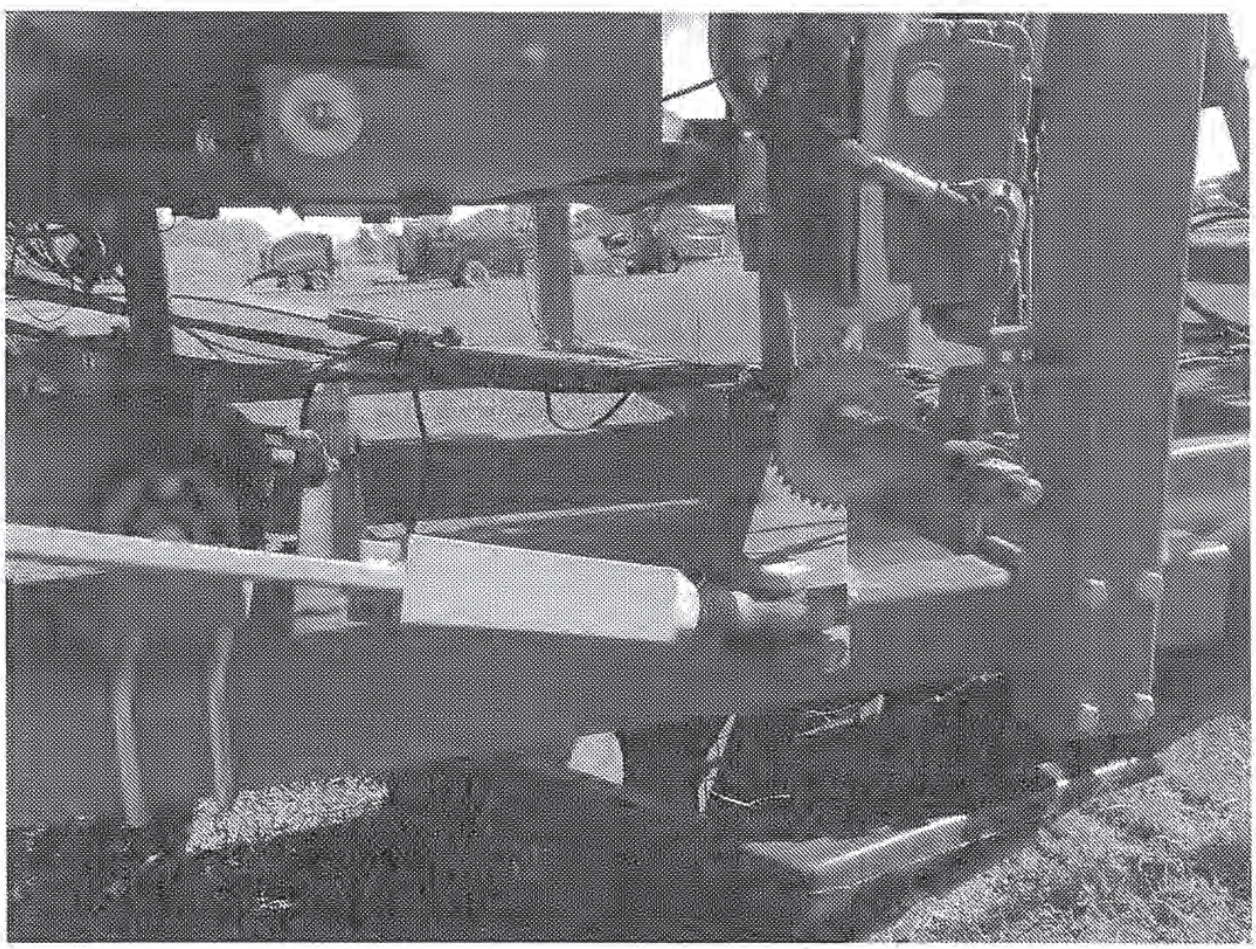
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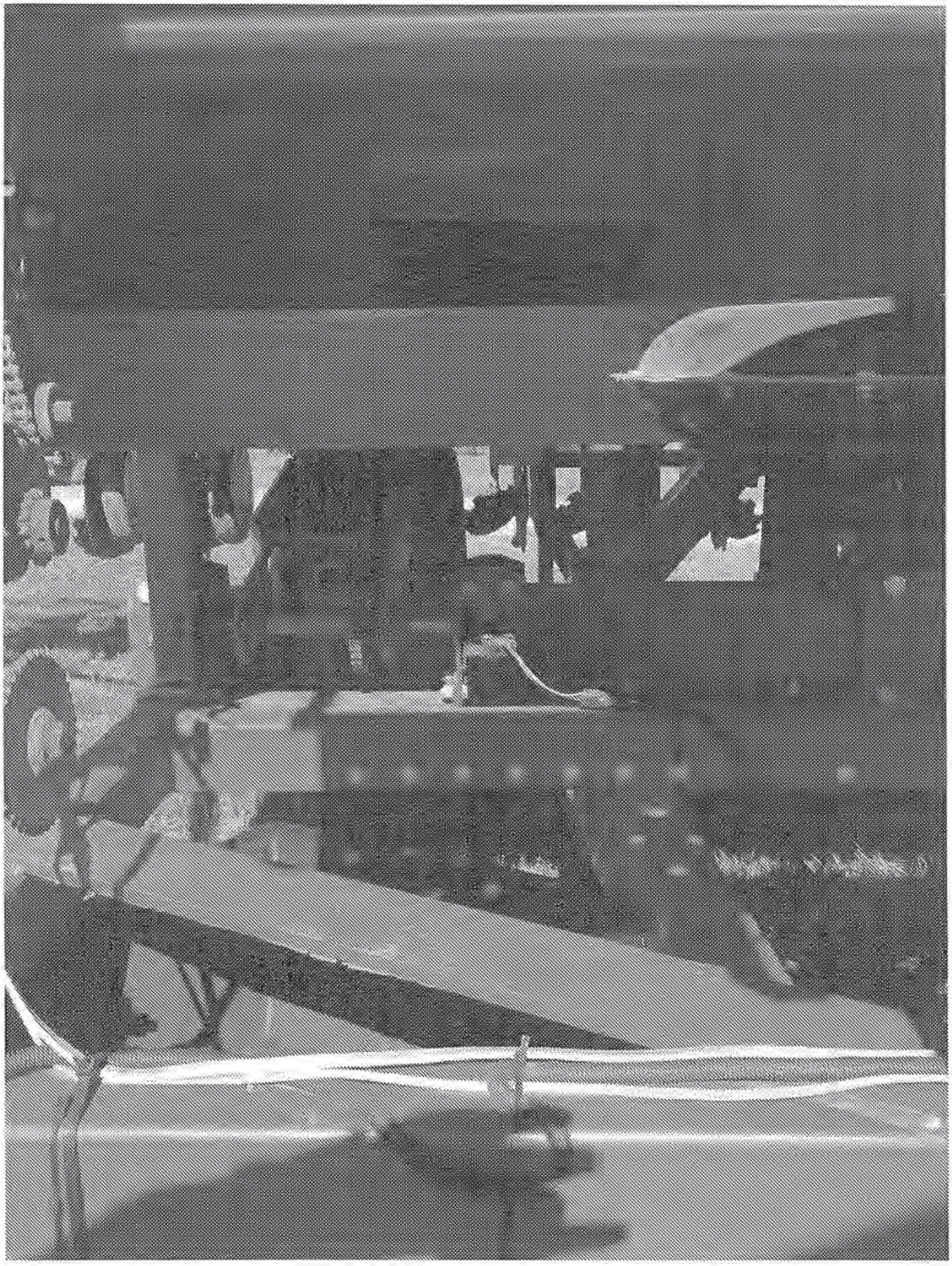
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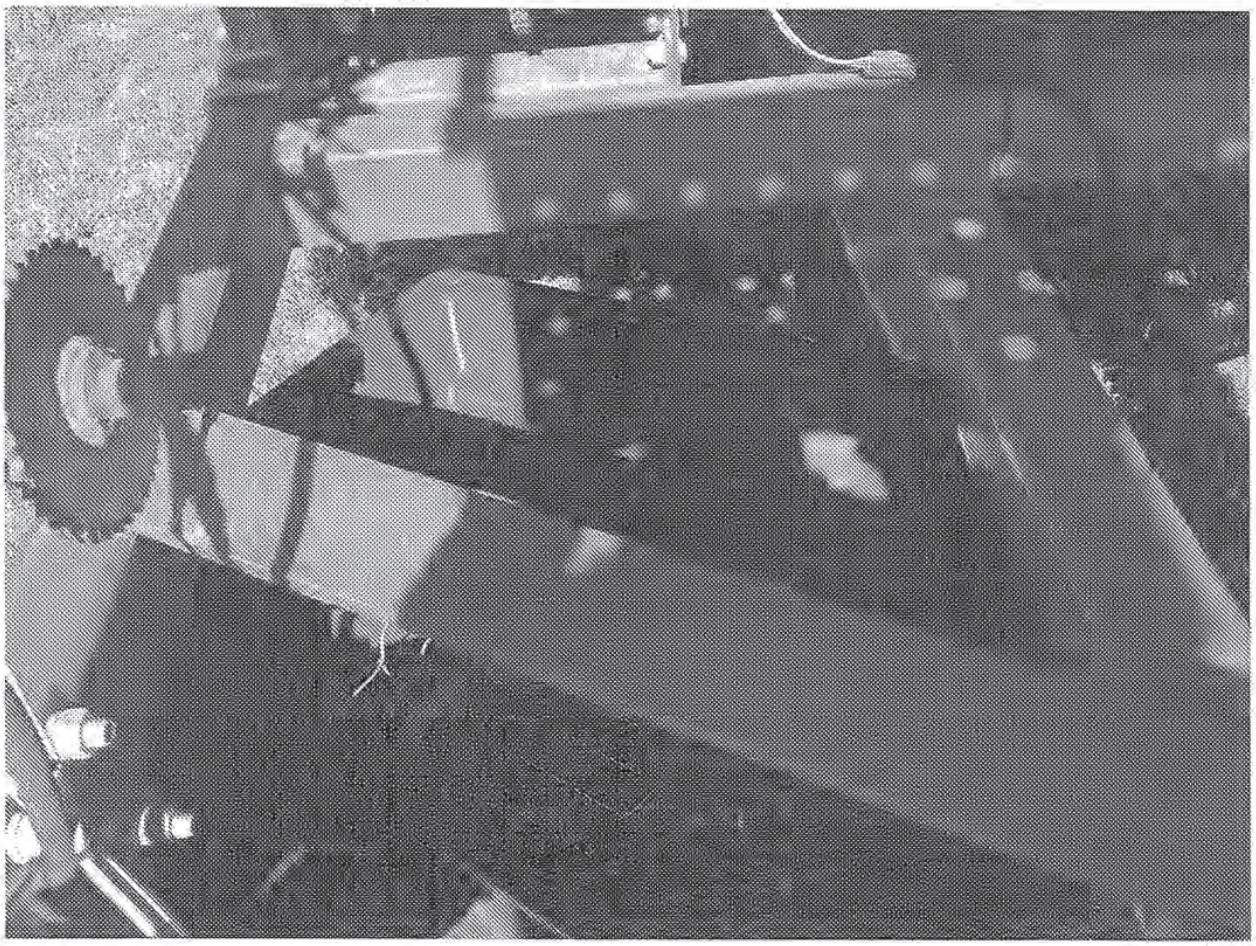
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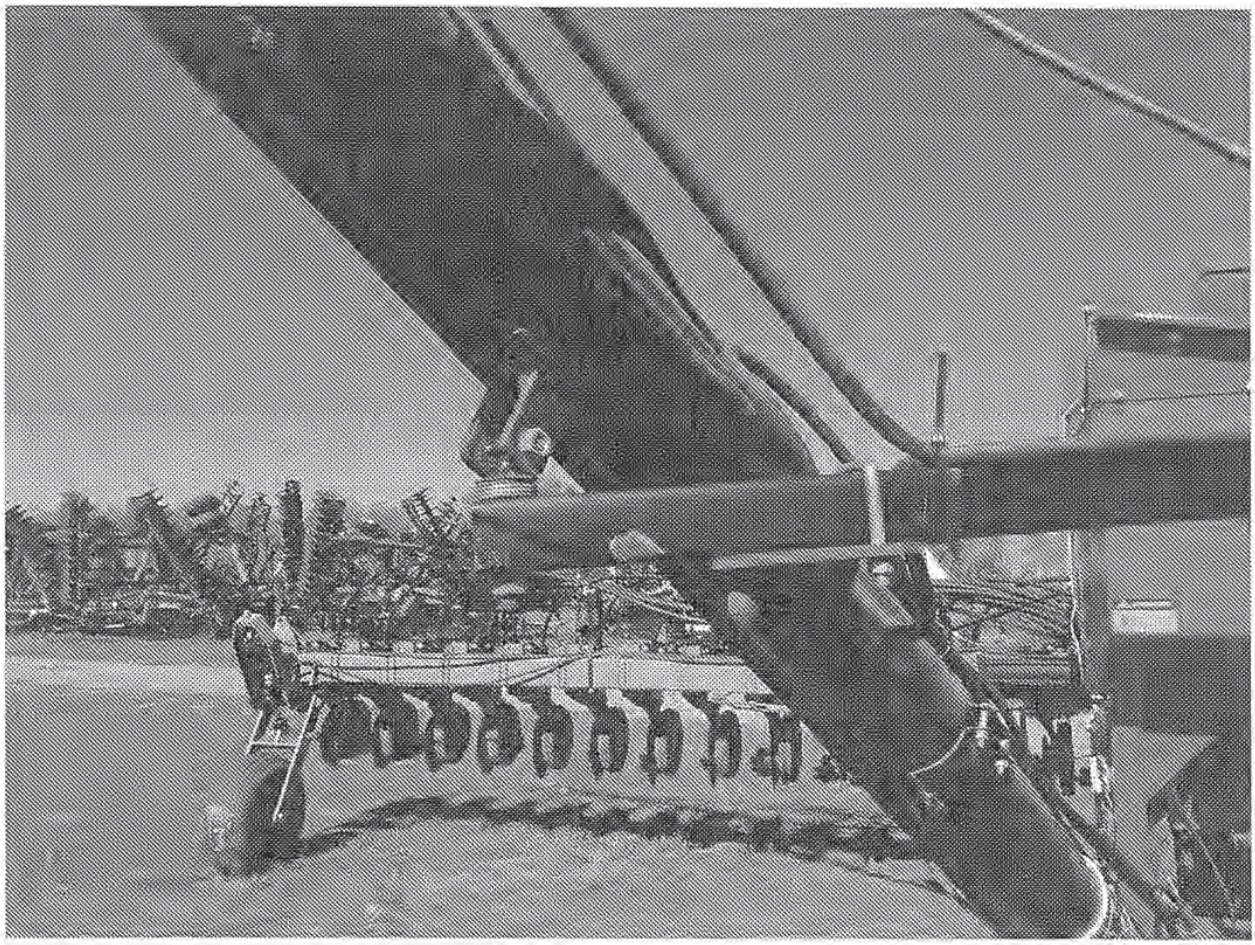
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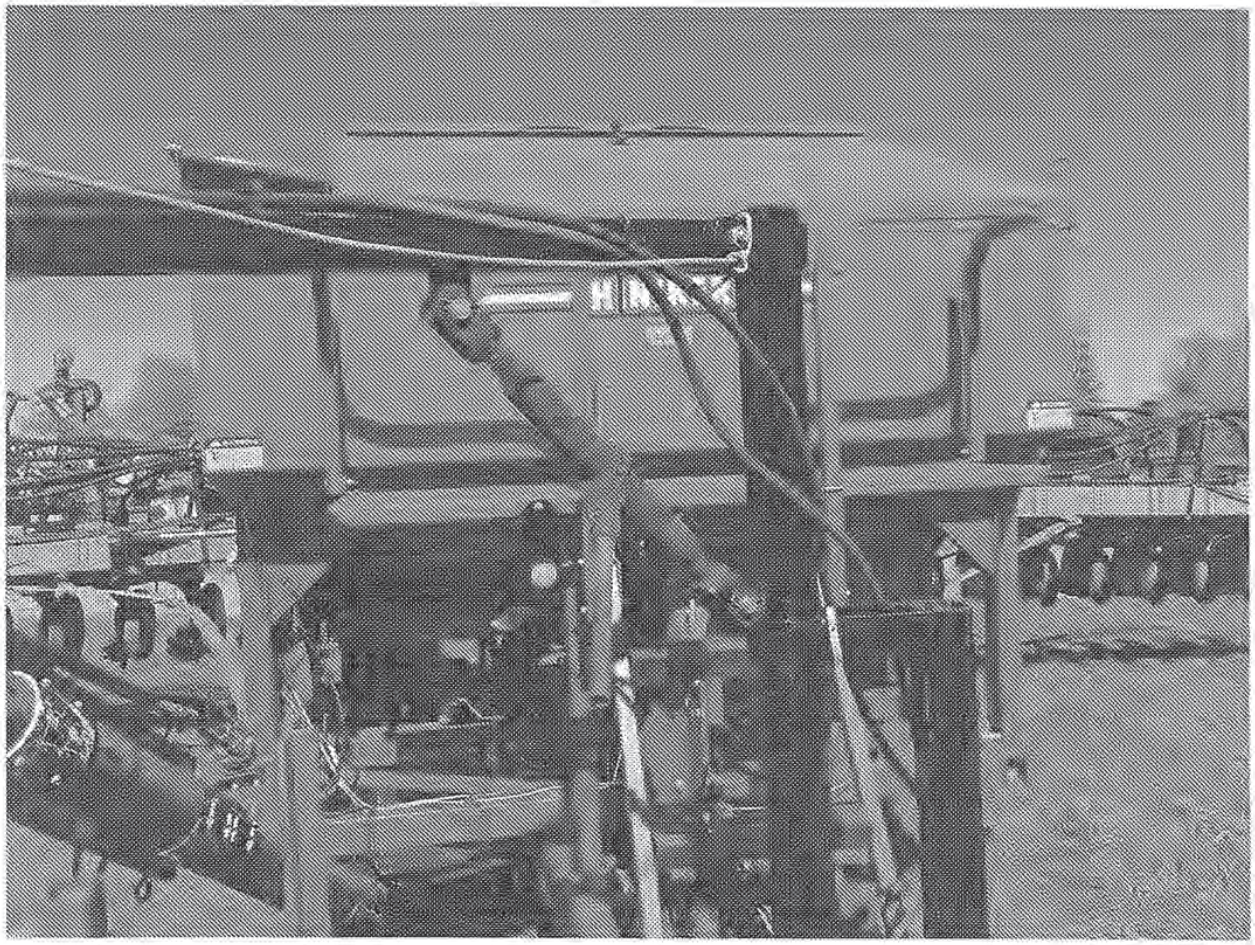
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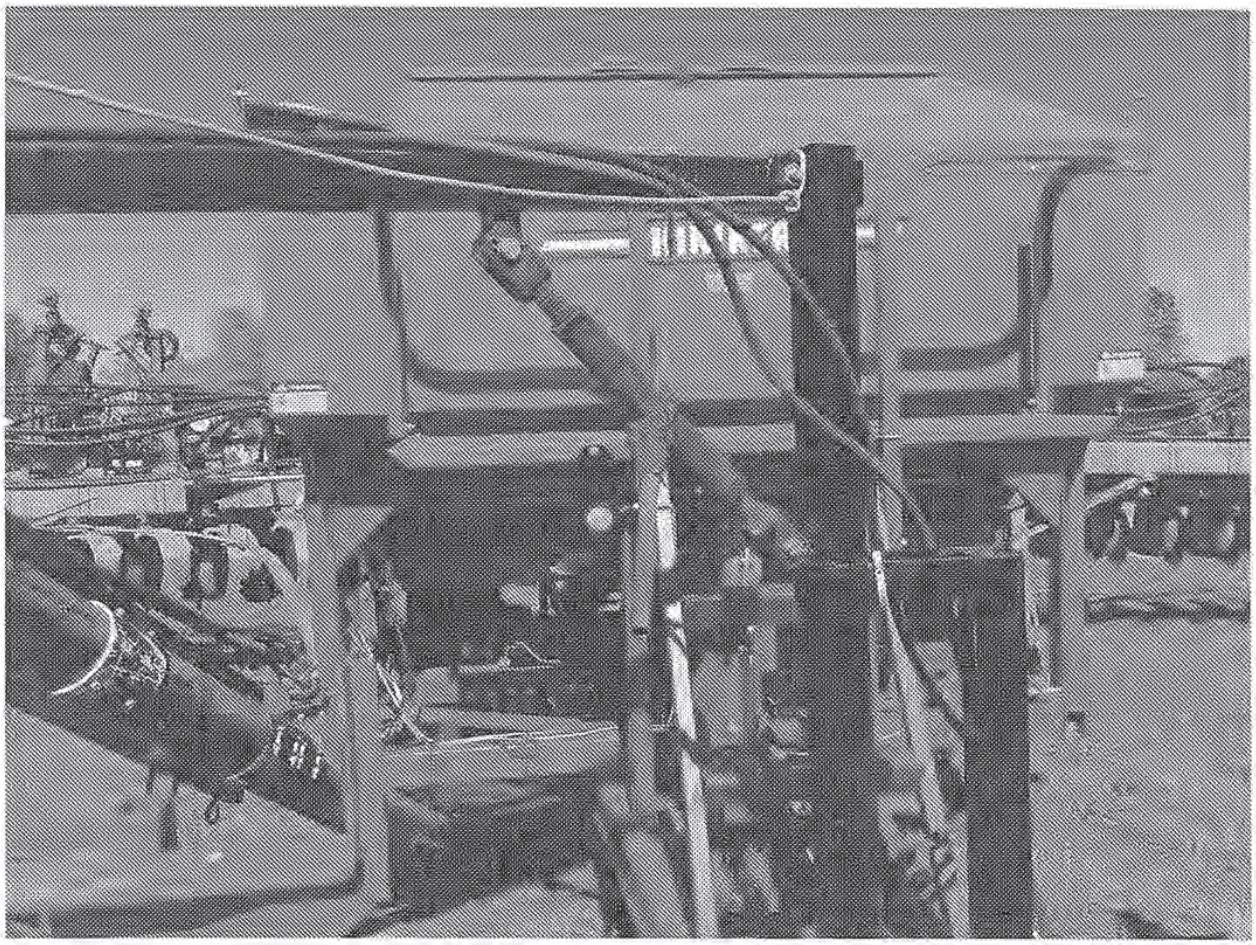
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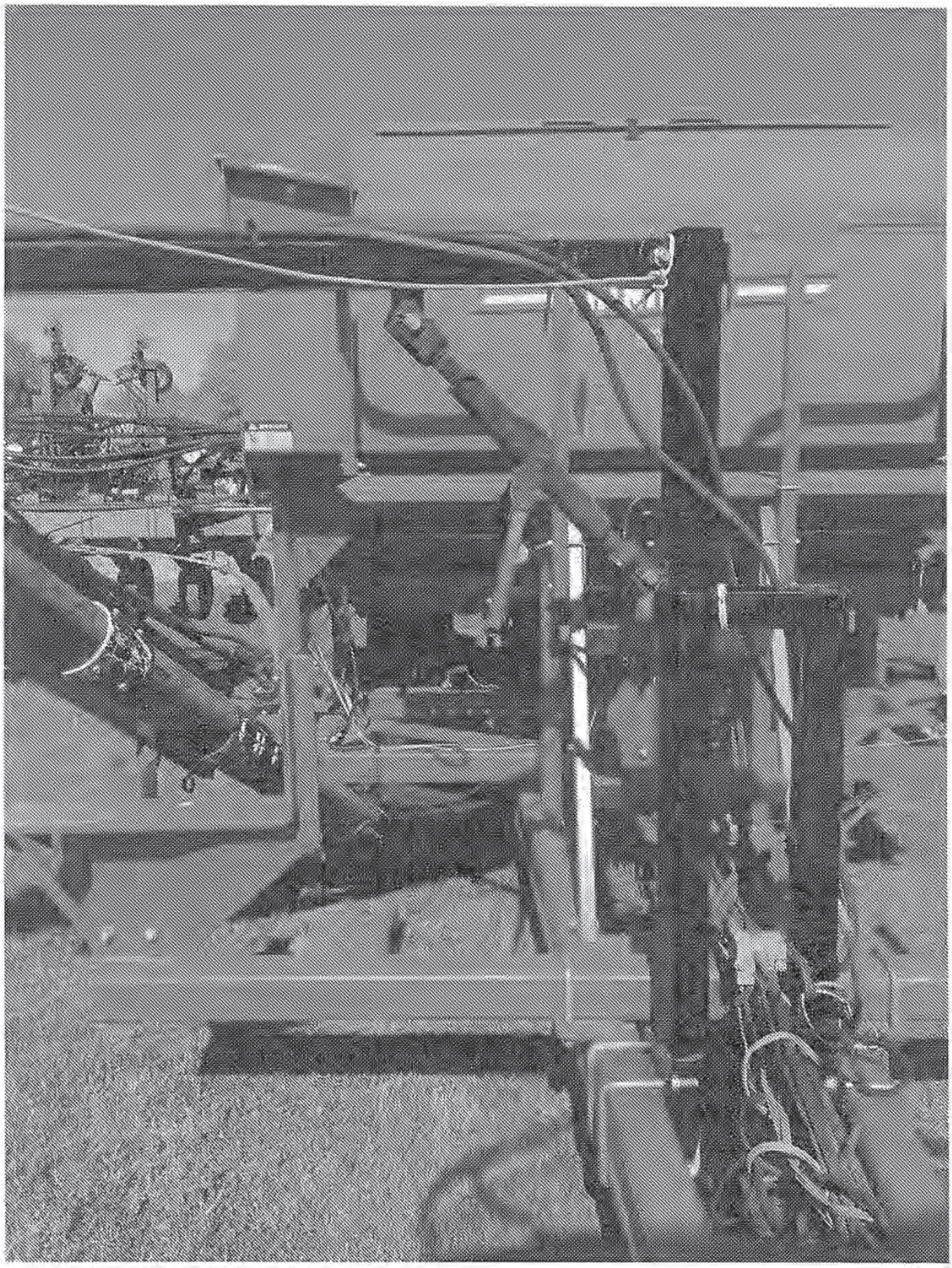
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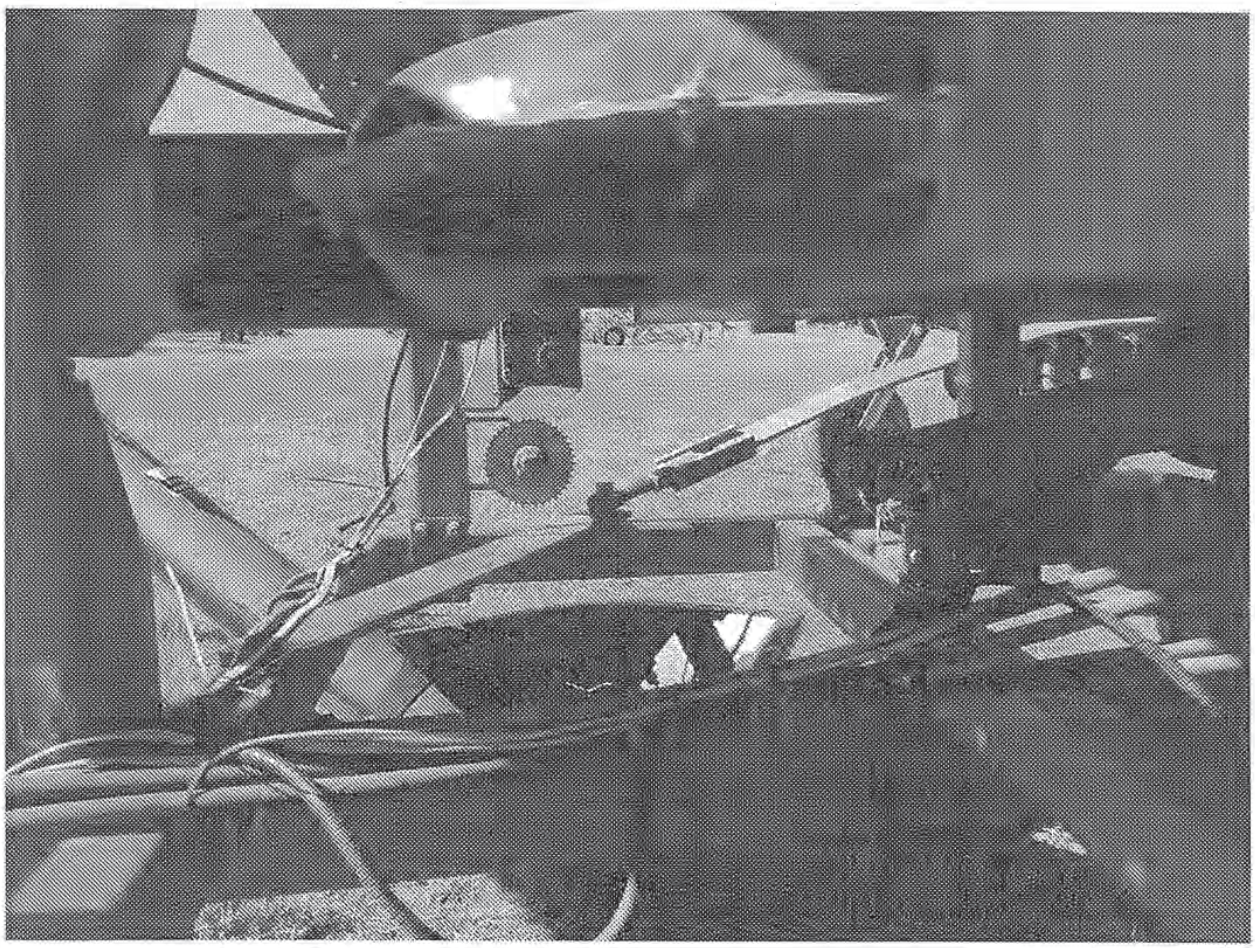
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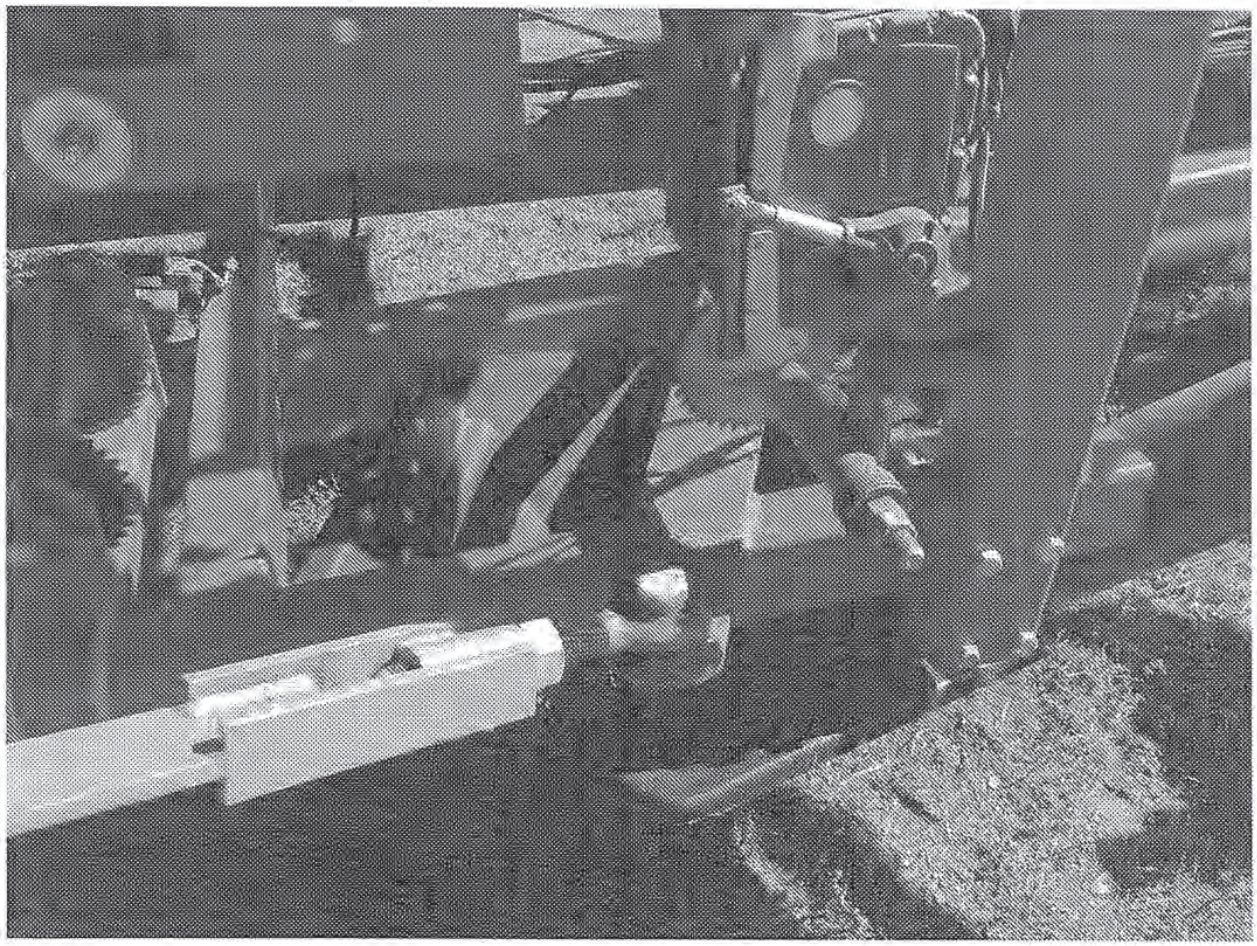
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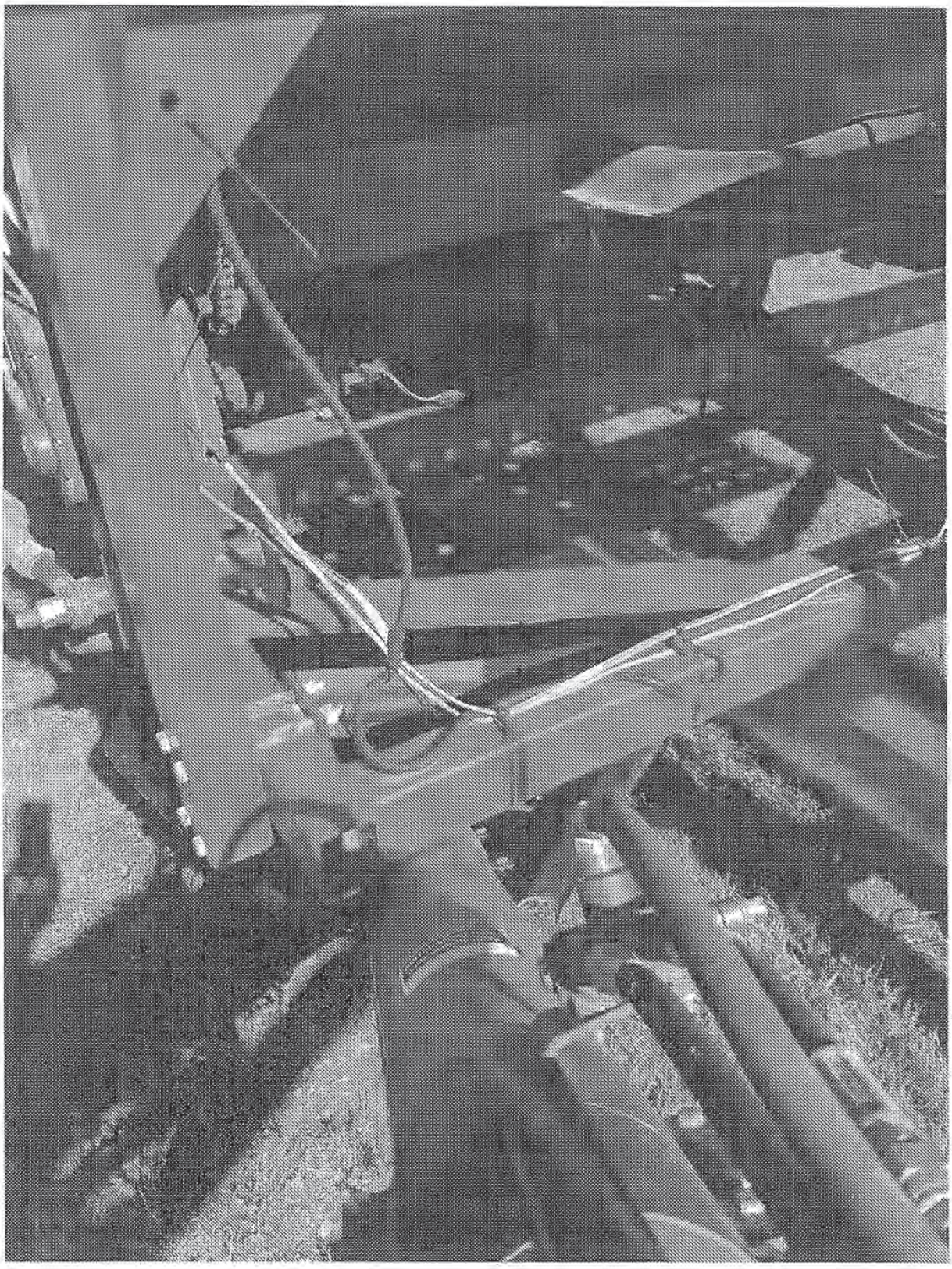
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JM-22-0000477



JM-22-0000478



JM-22-0000479



JM-22-0000480



JM-22-0000481



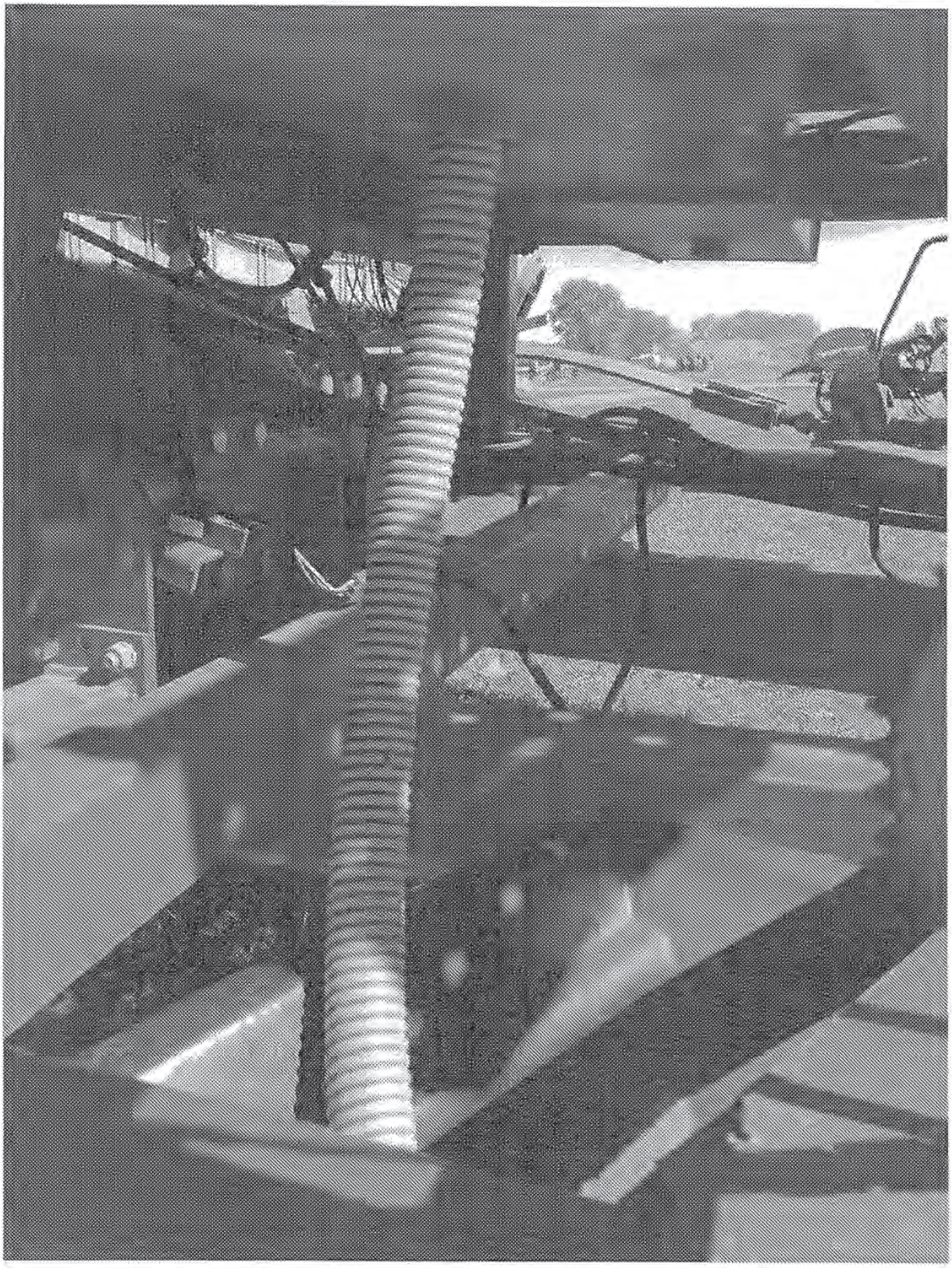
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JM-22-0000483



JM-22-0000484



JM-22-0000485



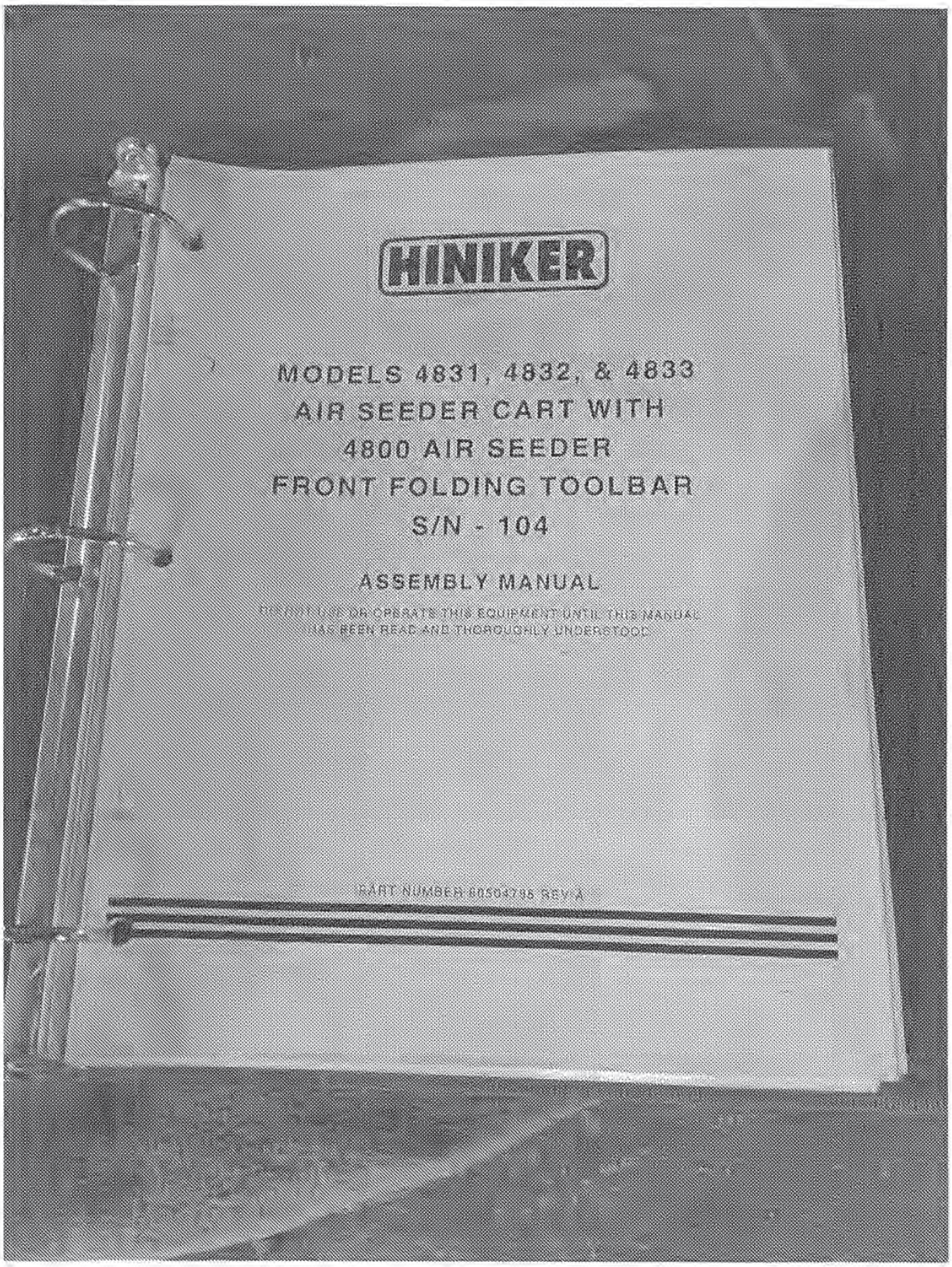
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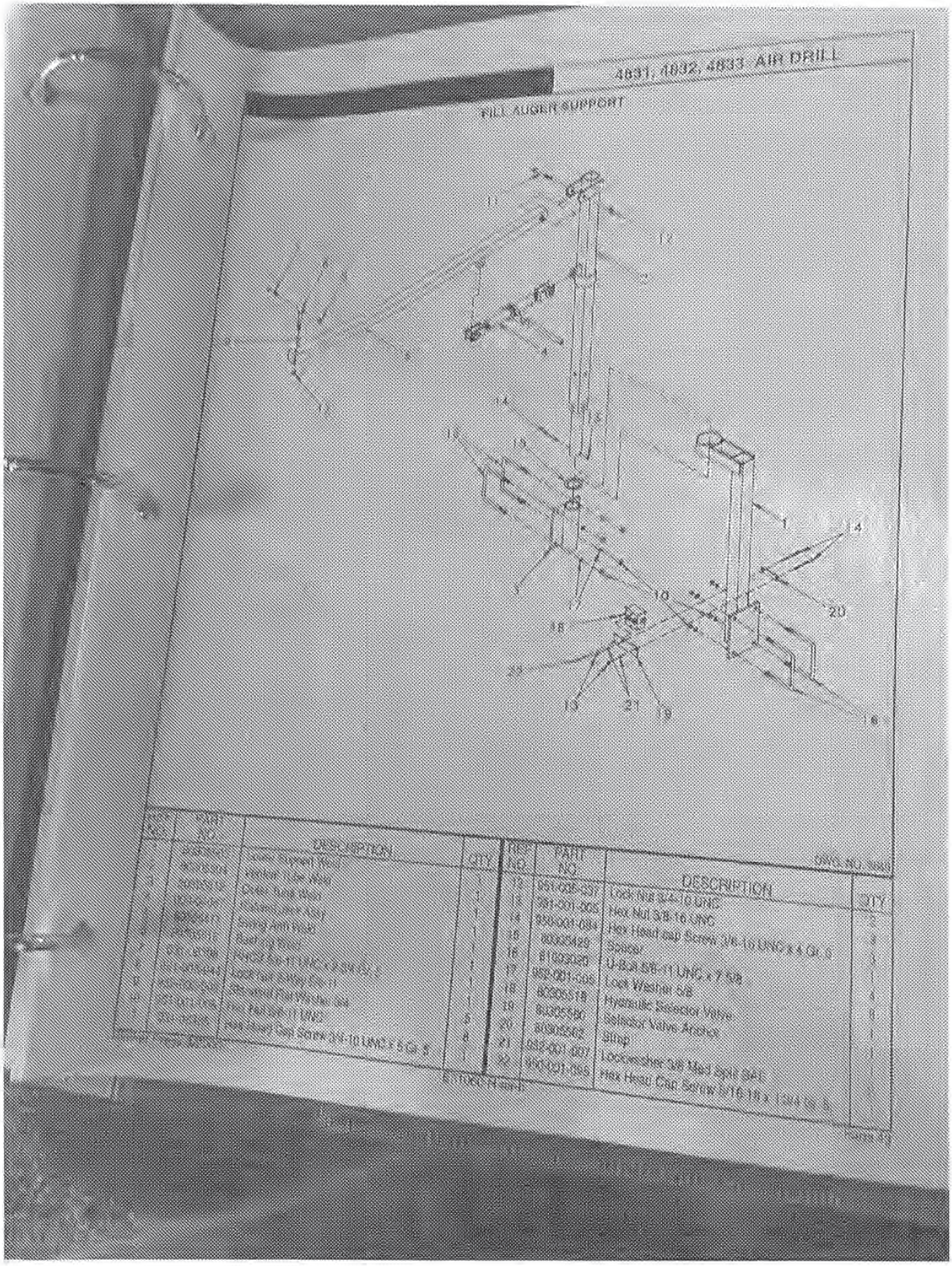
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JM-22-0000488

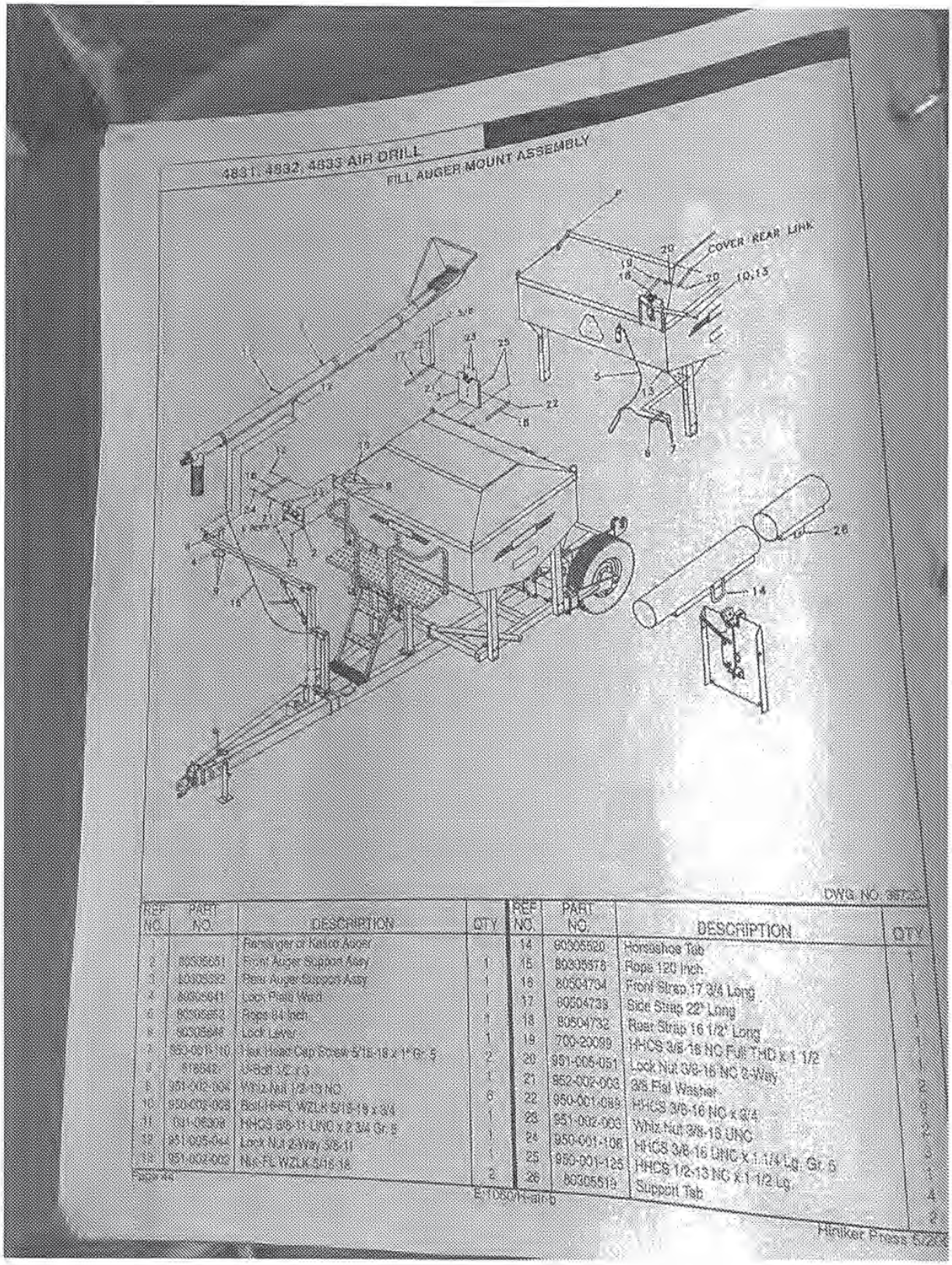


JM-22-0000489



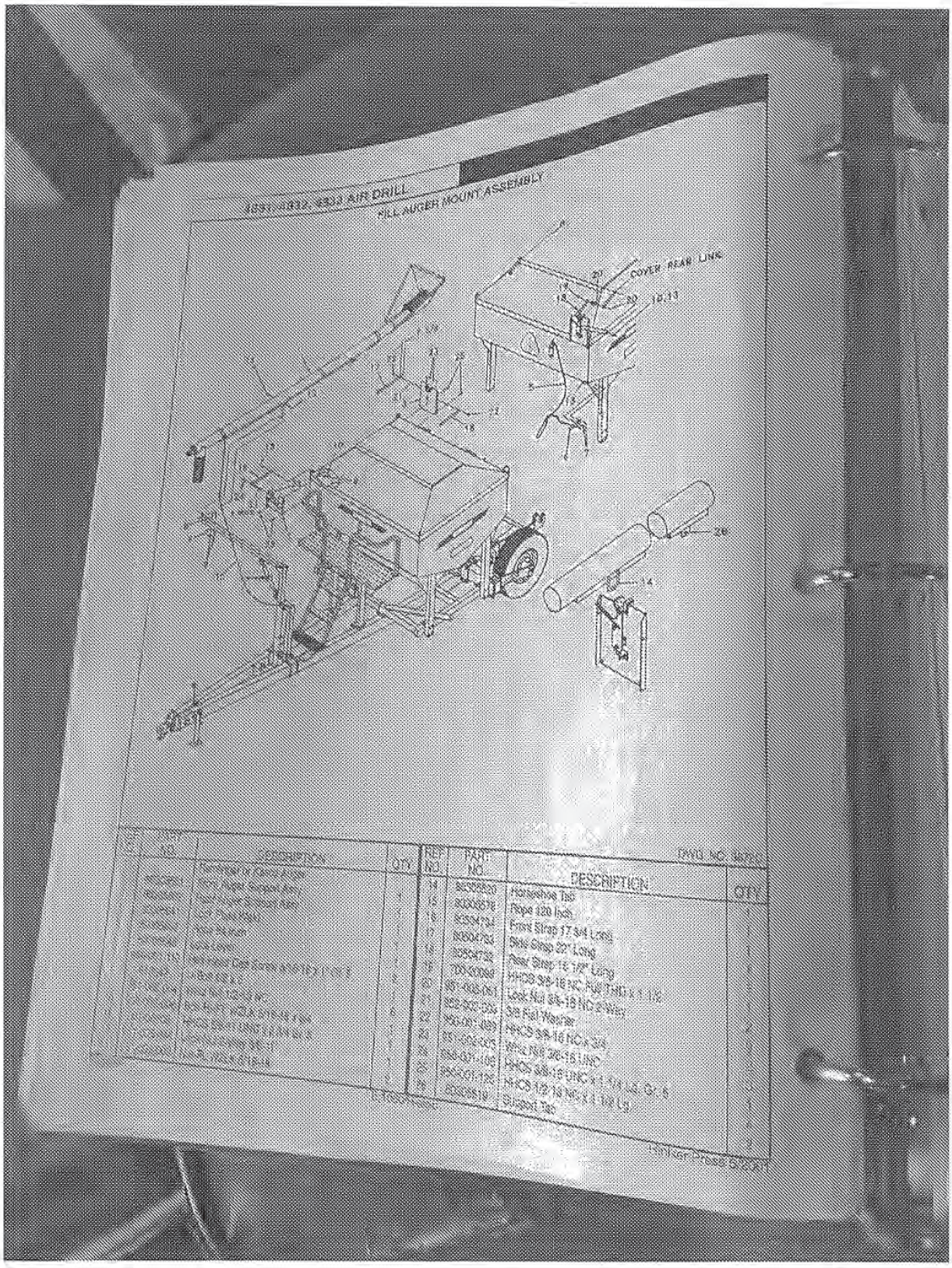
REF. NO.	PART NO.	DESCRIPTION	QTY.
13	951-025-337	Lock Nut 3/4-16 UNC	2
14	991-001-305	Hex Nut 3/8-16 UNC	3
15	990-001-084	Hex Head cap Screw 3/8-16 UNC x 4 Gr. 5	3
16	9000-5429	Screw	3
17	8160-3020	U-Bolt 5/8-11 UNC x 7 5/8	4
18	952-201-035	Lock Washer 5/8	8
19	8000-5518	Hydraulic Selector Valve	1
20	8030-5506	Selector Valve Anchor	1
21	8030-5502	Strap	1
22	952-001-037	Lockwasher 3/8 Med Split DAE	2
23	990-001-056	Hex Head Cap Screw 3/8-16 x 1 3/4 Gr. 5	2

JM-22-0000490



REF NO.	PART NO.	DESCRIPTION	QTY.
1		Remainder of Kelch Auger	1
2	80305851	Front Auger Support Assy	1
3	80305852	Rear Auger Support Assy	1
4	8832-041	Lock Pivot Weld	1
5	80305853	Pipe 84 Inch	1
6	80305848	Lock Lever	1
7	852-005-110	Flat Head Cap Screw 5/16-18 x 1" Gr. 5	2
8	816548	U-Bolt 1/2" x 3	1
9	951-002-004	Whiz Nut 1/2-13 NC	6
10	950-005-008	Bolt Hex WZLK 5/16-18 x 3/4	1
11	701-08308	HHCS 3/8-11 UNC x 2 3/4 Gr. 5	1
12	951-005-004	Lock Nut 2-Way 3/8-11	1
13	951-002-005	Nut FL WZLK 5/16-18	2
14	80305520	Horseshoe Tab	1
15	80305878	Rope 120 Inch	1
16	80504734	Front Strap 17 3/4 Long	1
17	80504739	Side Strap 22" Long	1
18	80504732	Rear Strap 16 1/2" Long	1
19	700-20089	HHCS 3/8-16 NC Full THD x 1 1/2	1
20	951-005-051	Lock Nut 3/8-16 NC 2-Way	2
21	952-002-003	3/8 Flat Washer	2
22	950-001-089	HHCS 3/8-16 NC x 3/4	2
23	951-002-003	Whiz Nut 3/8-16 UNC	2
24	950-001-106	HHCS 3/8-16 UNC x 1 1/4 Lg. Gr. 5	3
25	950-001-125	HHCS 1/2-13 NC x 1 1/2 Lg.	1
26	80305519	Support Tab	4
			2

JM-22-0000491



JM-22-0000492

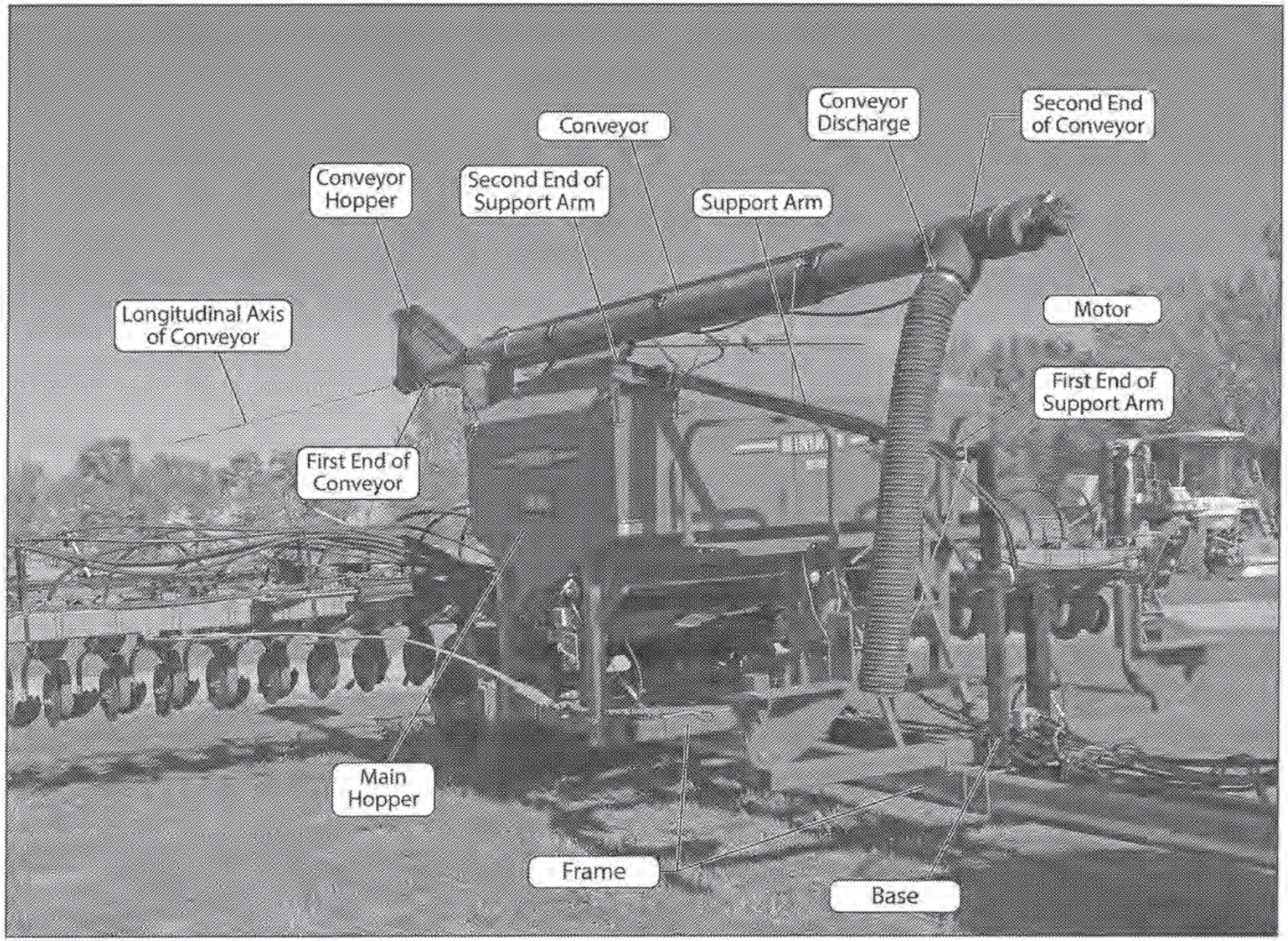

Conveyor
Conveyor Discharge
Second End of Conveyor
Conveyor Hopper
Second End of Support Arm
Support Arm
Longitudinal Axis of Conveyor
Motor
First End of Support Arm
First End of Conveyor
Main Hopper
Frame
Base

Photo 1

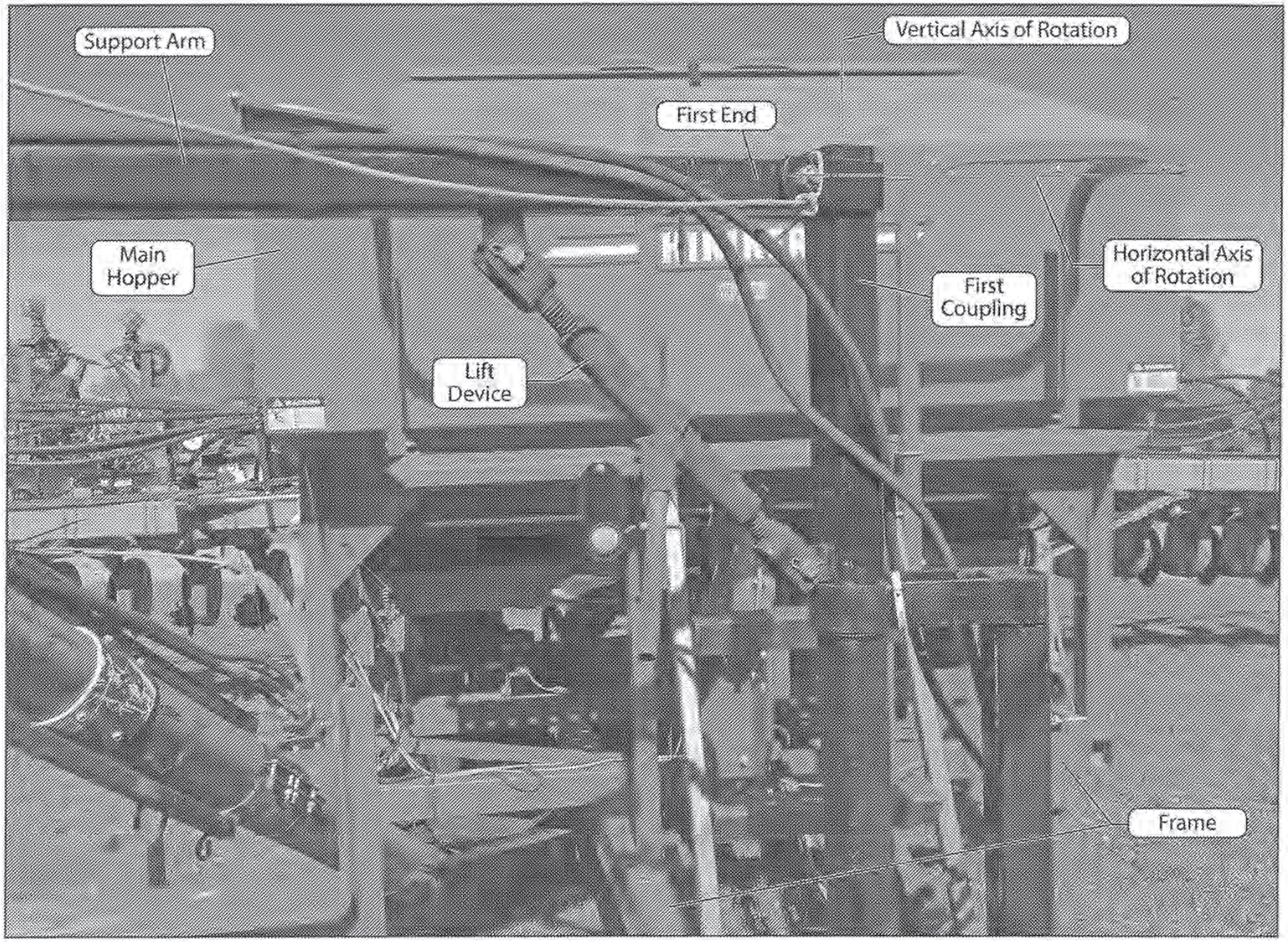

Support Arm
Vertical Axis of Rotation
First End
Main Hopper
Horizontal Axis of Rotation
First Coupling
Lift Device
Frame

Photo 2

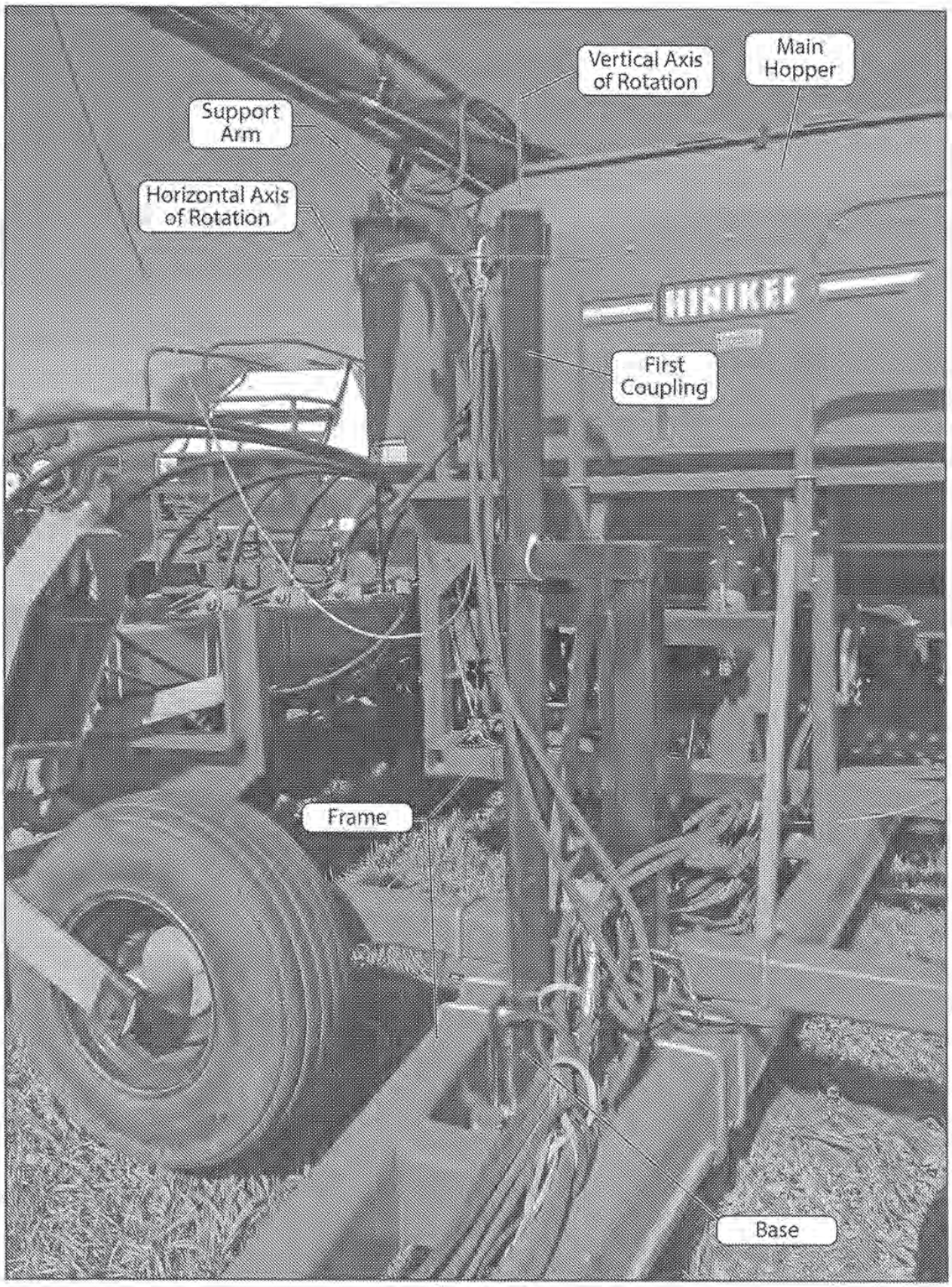

Vertical Axis of Rotation
Main Hopper
Support Arm
Horizontal Axis of Rotation
HINIKER
First Coupling
Frame
Base

Photo 3

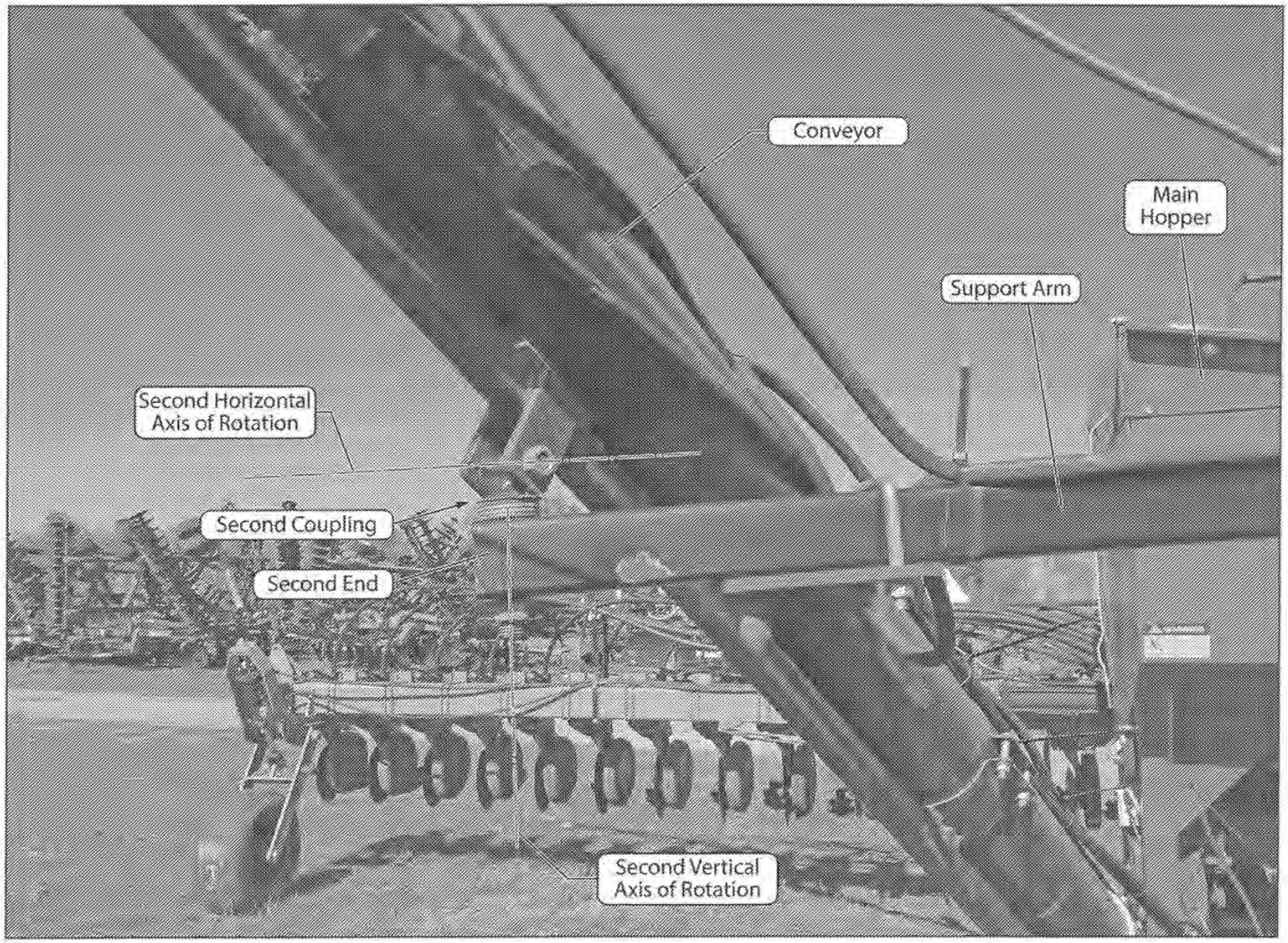

Conveyor
Main Hopper
Support Arm
Second Horizontal Axis of Rotation
Second Coupling
Second End
Second Vertical Axis of Rotation

Photo 4

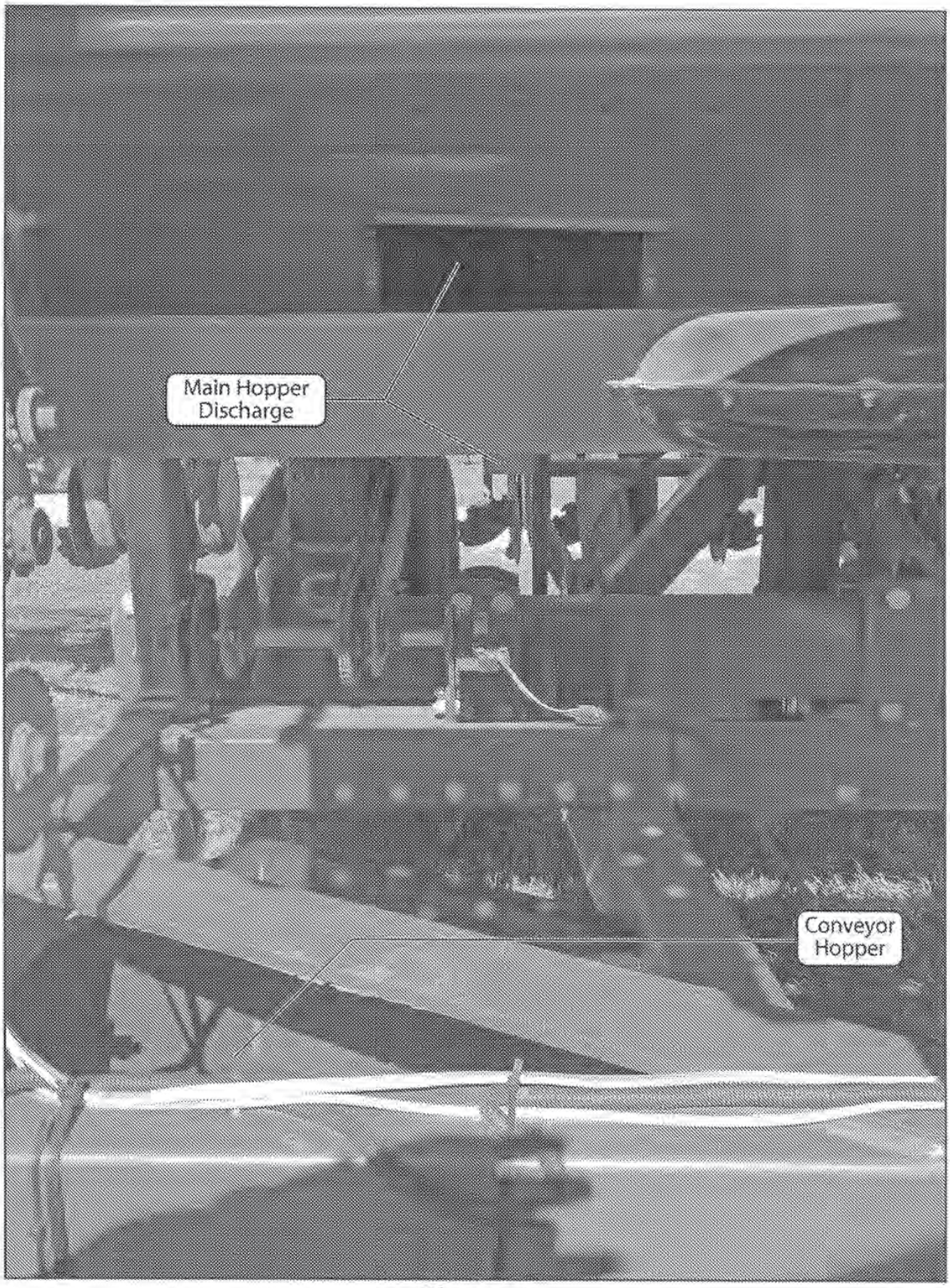


Photo 5



Photo 6



Photo 7

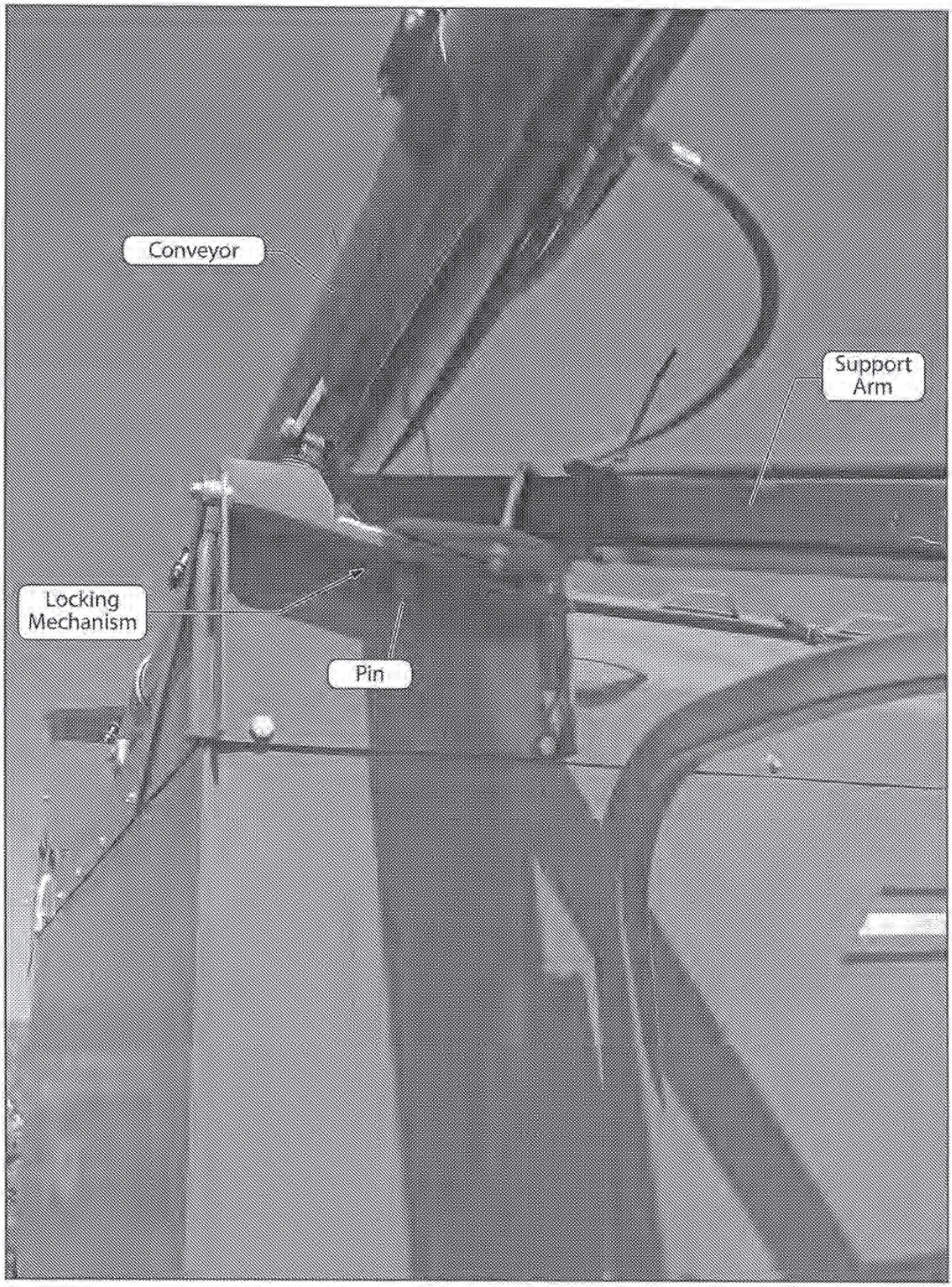
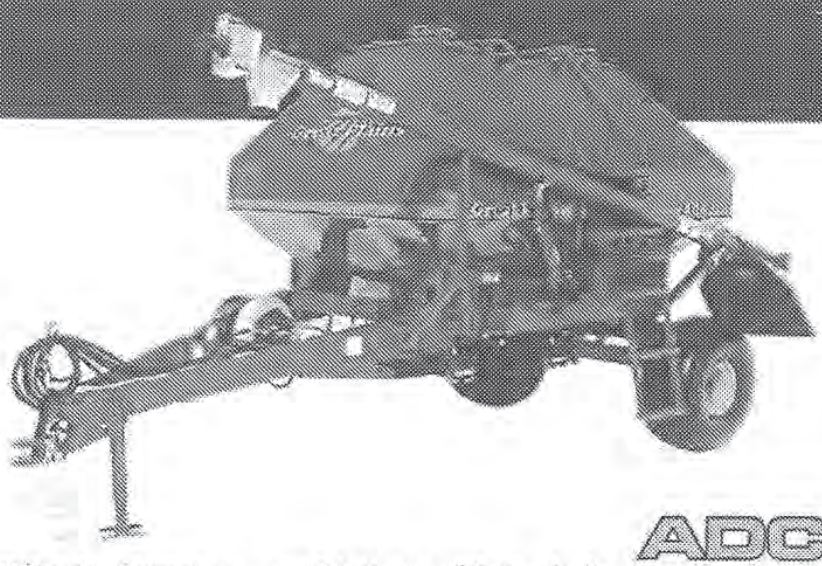


Photo 8

220 BUSHEL AIR CART

from Great Plains

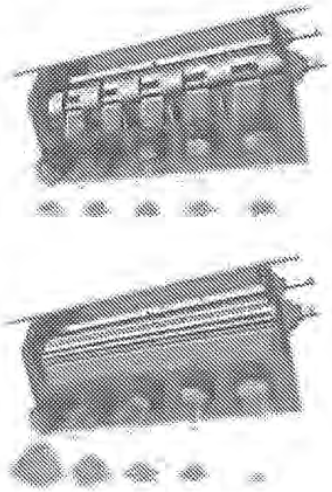


MODELS

ADC2220

The ADC2220 cart is designed as an economical high capacity bulk seeding alternative to conventional linear box drills. The ADC2220 is a pull-between cart designed to be semi-mounted to either HD, No-Till or Min-Till pull-behind Great Plains air implements.

CONFIGURED METER



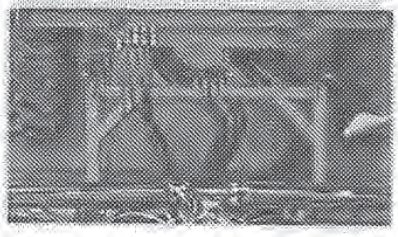
Competitive meters can cross-feed when on slopes (bottom image), starving "uphill" openers. Great Plains' meter box (top image) has one star wheel per tower, eliminating cross-feeding and increasing planting consistency.

LOAD/UNLOAD AUGER

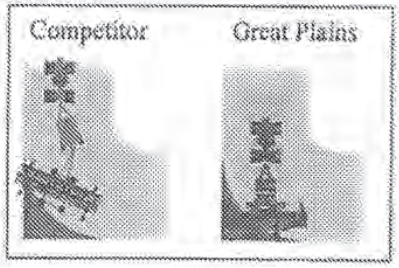


Dual purpose design allows you to load and unload with the same auger. It stores conveniently on the side of the cart and is balanced to allow easy handling.

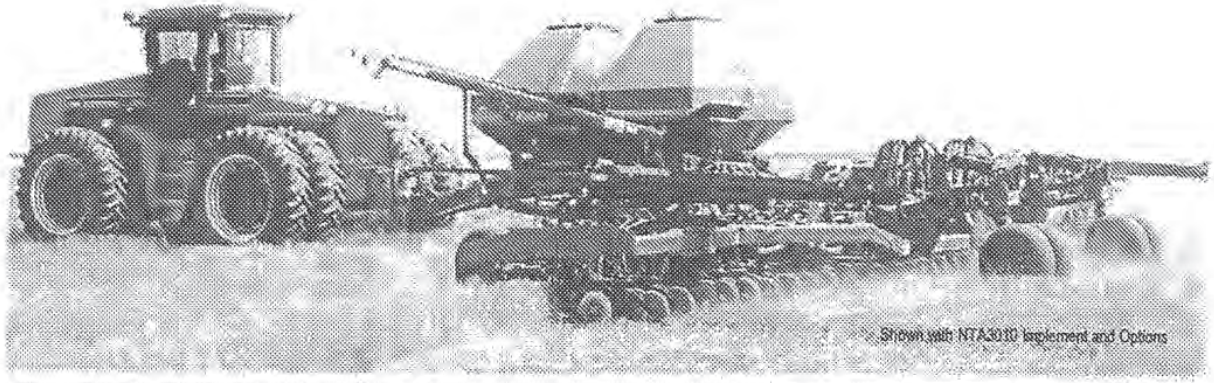
SEMI MOUNTED IMPLEMENT



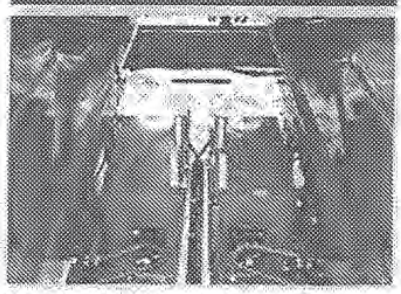
Our pull between Air Drill carts feature a semi-mounted cart-to-implement design. This design allows the implement to "Float" independent of the air cart and shortens the overall length on the air drill by up to 15'. This feature also give the cart and implement the ability to back into machine sheds and field corners.



JM-22-0000621

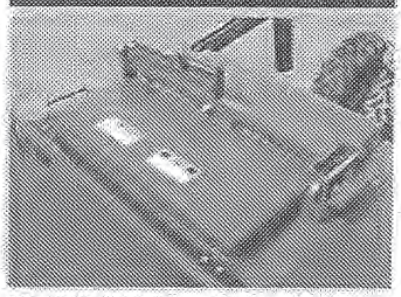

Shown with NTA3010 Implement and Options

VERSATILE GEARBOXES



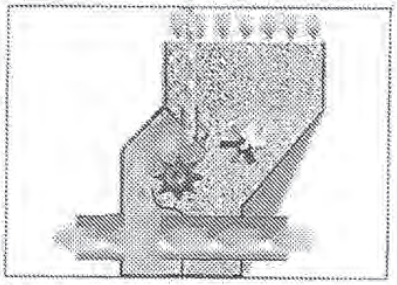
Five input and five output settings provide twenty five gear combinations without changing sprockets or breaking chains.

220 BUSHEL HOPPER DESIGN



Two 110 (3,876L) bushel steel hoppers provide ample capacity. The ADC2220 can be set up with seed in both hoppers or seed in one and fertilizer in the other.

PRESSURIZED TANKS



Pressurized hoppers allow seed to enter the air flow without restrictions for exceptional metering.

EASY READ PRESSURE GAUGE



Quickly check the fan pressure from the cab with the large pressure gauge conveniently located at the front of the cart.

220 BUSHEL AIR CART SPECIFICATIONS

Model Name	ADC2220
Capacity	2- 110 bu. (3,876L)Steel Hoppers
Weight	5060 lbs (2,431kg)
Width	12' 2" (3.70m)
Height	10' 6" (3.20m)
Length	18' 10" (5.74m)
Tire Size	16.5 - 16.1
Auger Size	6" (15.24cm)

OPTIONS

- Small Diameter Clevis
- Small Diameter Strap
- Large Diameter Cast Hitch

Note: All specifications subject to change without notice.
*Weights based on 7.5" (19.05cm) spacing and will vary depending on options.

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO
WESTERN DIVISION

UNVERFERTH MFG. CO., INC.,	)	Civil Action No. 3:16-cv-02282-JZ
	)	
Plaintiff,	)	
	)	
v.	)	
	)	
J&M MFG. CO., INC.	)	
	)	
Defendant.	)	

J&M MFG. CO., INC.'S AMENDED INITIAL INVALIDITY CONTENTIONS

In accordance with L.P.R. 3.5 and L.P.R. 3.10, defendant, J&M Mfg. Co., Inc. ("J&M"), submits the following Amended Initial Invalidity Contentions. J&M makes this disclosure based on limited discovery and based on J&M's current understanding of Unverferth's construction of the claims of the patents-in-suit. J&M reserves the right to supplement or amend these Initial Invalidity Contentions as information is discovered or confirmed during fact discovery; information is discovered, confirmed, or provided by a party's consultant or expert after the party's contentions have been served; amendments are made to the pleadings; information is learned from or positions are taken by another party during the exchange-of-contentions process set forth in the Local Patent Rules; information is learned from or positions are taken by another party during the claim construction process; rulings are made by the Court, such as the Court's Claim Construction Order; and as otherwise permitted or required under the Federal Rules of Civil Procedure, the Local Rules, and the Local Patent Rules.

A. Identification of Prior Art

Below is a list of prior art that anticipates or renders obvious U.S. Patent Nos. 8,221,047 ("the '047 Patent") and 8,967,940 ("the '940 Patent"):

Patent Number	Country of Origin	Date of Issue
3,498,483 "Meharry '483"	U.S.	March 3, 1970
4,491,216 "Sawby '216"	U.S.	Jan. 1, 1985
5,718,556 "Forsyth '556"	U.S.	Feb. 17, 1998
5,888,044 "Baskerville '044"	U.S.	March 30, 1999
7,500,814 "Meyer '814"	U.S.	Mar. 10, 2009
7,500,817 "Furrer '817"	U.S.	Mar. 10, 2009
2,465,667 "Deboffles '667"	France	Mar. 27, 1981
2,416,677 "Hundeby '677"	Canada	Aug. 13, 2004 (published)

The '047 and '940 Patents are also invalid in view of other non-patent prior art:

Prior Art	Date	Type
Hiniker Air Seeder Cart with Auger Mount Kit	Ordered on October 2, 2000 Shipped on January 31, 2001	prior sale (annotated photographs)
Hiniker Model 4836 Air Seeder Cart Operator's Manual	January 1999	printed publication
Hiniker Models 4831, 4832, 4833 Air Seeder Cart Assembly Manual	January 2000	printed publication
Hiniker Air Seeder Cart with Auger Mount Kit	May 1998	public use (video)
Great Plains Air Drill Cart Parts Manual for Model	March 1, 2000	printed publication

ADC2220		
Great Plains Air Drill Cart Parts Manual for Model ADC2220	May 1, 1997	printed publication
Great Plains ADC2220 Publication	prior to February 15, 2007[1]	printed publication
Great Plains Air Drill Cart Model ADC2220	prior to February 15, 2007	public use and prior sale

The '047 and '940 Patents are also invalid because Unverferth's seed tenders were publically used or sold in the U.S. more than one year prior to February 15, 2007, the filing date of U.S. Provisional Application No. 60/901,321. Discovery has just begun and J&M reserves the right to supplement these contentions regarding Unverferth's activities regarding its seed tenders more than one year prior to February 15, 2007.

B. Invalidity Positions

The chart required by L.P.R. 3.5(c) is attached as Exhibit 1.

The Hiniker Air Seeder Cart with Auger Mount Kit anticipates at least claims 1 and 20 of the '047 Patent and claims 1, 8, and 16 of the '940 Patents.

Meharry '483, Sawby '216, Forsyth '556, Baskerville '044, Meyer '814, Deboffles '667, Hundeby '677, Hiniker Air Seeder Cart with Auger Mount Kit, and Great Plains Air Drill Cart disclose a seed tender with a hopper and a conveyor that can be moved between a load position to dispense agricultural product into the hopper or an unload position to receive agricultural product from the hopper discharge opening ("the load/unload prior art"). Any of the load/unload prior art in combination with Furrer '817 render all of the asserted claims obvious. Alternatively, all of the asserted claims are obvious in view of the load/unload prior art because it would have been a matter of mere design choice to place a base under the hopper and rotably couple a support arm to the base.

[1] J&M is investigating the actual publication date.

The seed tender described and claimed in the '047 and '940 Patents embodies well-known structures and functionality. There is nothing inventive about it. In fact, the basic concept–a send tender with a conveyor moveable between load and unload positions–had been around for forty years before Unverferth filed its provisional application in 2007. The seed tender in Meharry '483 discloses a seed tender with a conveyor moveable between load and unload positions. The other load/unload prior art also teach this basic concept.

The seed tender in the '047 and '940 Patents copies all the main components of the load/unload prior art, but places the base under the main hopper discharge. There is nothing inventive about copying the prior art and then positioning the base under the main hopper discharge. In fact, Furrer '817 already teaches a base under the main hopper discharge and supporting the conveyor from below so that the conveyor can rotate about both vertical and horizontal axes relative to the base. The asserted claims are clearly obvious in view of any combination of the load/unload prior art with Furrer '817 and because moving the base under the main hopper discharge was merely a simple design choice. Further, once the base is located under the main hopper or main hopper discharge, which Furrer '817 clearly shows, all elements of the asserted dependent claims become inherent features of that design choice.

In addition to being invalid in view of prior art, certain asserted claims are invalid for failing to comply with 35 U.S.C. § 112:

- Claims 1 and 20 of the '047 Patent and claims 1, 8, and 16 of the '940 Patent are indefinite because the term "first coupling" viewed in light of the specification and prosecution history, fails to inform those skilled in the art about the scope of the invention with reasonable certainty. The specification does not mention the term "first coupling" and the figures do not identify any structure as the "first coupling."

- Claims 1 and 20 of the '047 Patent and claims 1, 8, and 16 of the '940 Patent are indefinite because the term "first vertical axis of rotation" viewed in light of the specification and prosecution history, fails to inform those skilled in the art about the scope of the invention with reasonable certainty. While the specification mentions a "vertical axis" at col. 3, l. 41 of the '047 Patent, for example, that "vertical axis" is not described with respect to the "first coupling" as recited in the claim, but with respect to

the "support arm" instead. The figures do not identify where the "first vertical axis of rotation" is located.

- Claims 1 and 20 of the '047 Patent and claims 1, 8, and 16 of the '940 Patent are indefinite because the term "first horizontal axis of rotation" viewed in light of the specification and prosecution history, fails to inform those skilled in the art about the scope of the invention with reasonable certainty. The specification does not mention the term "first horizontal axis of rotation" and the figures do not identify where the "first horizontal axis of rotation" is located.

- Claims 16 and 20 of the '047 Patent are indefinite because the term "locking mechanism" viewed in light of the specification and prosecution history, fails to inform those skilled in the art about the scope of the invention with reasonable certainty. The specification does not mention the term "locking mechanism" and the figures do not identify any structure as the "locking mechanism."

- Claim 16 of the '940 Patent is indefinite because the term "first conveyor axis of rotation" viewed in light of the specification and prosecution history, fails to inform those skilled in the art about the scope of the invention with reasonable certainty. The specification does not mention the term "first conveyor axis of rotation" and the figures do not identify where the "first conveyor axis of rotation" is located.

- Claims 1 and 20 of the '047 Patent and claims 1, 8, and 16 of the '940 Patent are not enabled in view of the term "first coupling" because one skilled in the art, after reading the specification, could not practice the claimed invention without undue experimentation.

- Claim 21 of the '047 Patent is invalid because it is not narrower in scope than independent claim 20.

C. Unenforceability

At this time, J&M does not contend that the '047 or '940 Patents are unenforceable for inequitable conduct. J&M reserves the right to amend its unenforceability contention as discovery in this case progresses and additional information becomes available or known to J&M.

D. Document Production

In accordance with L.P.R. 3.6, J&M is producing documents with these invalidity contentions bearing production numbers JM-22-0000229-622. A translation of Deboffles '667 is produced with these amended contentions bearing production numbers JM-22-0021686-692.

Dated: February 7, 2017

Respectfully Submitted,

/s/ J. Robert Chambers

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Lisa M. A. Nolan
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ATTORNEYS FOR DEFENDANT
J&M MFG. CO., INC.

CERTIFICATE OF SERVICE

I hereby certify that, on February 7, 2017, I served **J&M MFG. CO., INC.'S AMENDED INITIAL INVALIDITY CONTENTIONS** on counsel of record via electronic mail.

/s/ P. Andrew Blatt

EXHIBIT 1

U.S. Patent No. 8,221,047

Claim 1	References
A seed or grain tender comprising:	Meharry '483 at col. 2, l. 35 (gravity bed vehicle 10). Sawby '216 at col. 2, ll. 8-10 (grain handling apparatus 1). Forsyth '556 at col. 4, ll. 15-17. Baskerville '044 at col. 3, l. 53 (seed cart 1). Meyer '814 at col. 2, l. 31 (cart 10). Furrer '817 at col. 3, ll. 41-42 (seed tender). Hundeby '677 at pg. 4 (cart 1). Deboffles '667 at Figs. 1-4 (No. 1). Hiniker Air Seeder Cart at Photo 1.[1] ADC2220 at Cover page.[2]

[1] The Hiniker Air Seeder Cart in the attached photographs is also described in the Hiniker Air Seeder Cart Operator's Manual (JM-22-0000310-376) dated January 1999 and Assembly Manual (JM-22-0000368-416) dated January 2000, *see, e.g.*, JM-22-0000315, 355, 356, 359, 369, 393, 398, 406. *See also* JM-22-0000418. A video shot May 1998 showing the structure and operation of a Hiniker Air Seeder Cart was produced with production number JM-22-0000425.

[2] Citations to ADC2220 refers pages from the Great Plains Air Drill Cart Parts Manual for Model ADC2220 dated 3/1/2000 having production numbers JM-22-0000554-620. A second ADC2220 Parts Manual dated 5/1/1997 was also produced at JM-22-0000493-553. A Great Plains ADC2220 Publication ("ADC2220 Publication") was also produced at JM-22-0000621-622. ADC2220 also refers to the prior public use and prior sale of the Great Plains Air Drill Cart Model No. ADC2200.

a frame	Meharry '483 at Figs. 1-3 (frame 20). Forsyth '556 at col. 4, l. 45 (frame 18). Baskerville '044 at col. 3, l. 55 (lower frame 2). Meyer '814 at col. 2, l. 37 (frame 12). Furrer '817 at col. 4, ll. 5-6 (frame 22). Hundeby '677 at Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 2). Hiniker Air Seeder Cart at Photos 1-3. ADC2220 at 2-1 (No. 1).

a main hopper mounted on said frame and having a main hopper discharge	Meharry '483 at col. 2, ll. 39 and 46 (gravity bed 21 and opening 12). Sawby '216 at col. 2, ll. 11-12 (grain bins or hopper 2); col. 3, l. 20 (outlet 36). Forsyth '556 at col. 4, l. 29 (compartment 6) and col. 5, l. 20 (ports). Baskerville '044 at col. 3, l. 58 (grain bin 11) and col. 4, ll. 3-4 (discharge opening 25). Meyer '814 at col. 2, l. 34 (first and second tanks 14, 16); col. 2, l. 36 (outlet 20). Furrer '817 at col. 3, ll. 45-46 (seed storage bin 13) and col. 4, l. 66–col. 5, l. 4 and Fig. 1A. Hundeby '677 at pg. 4 (tanks 2 and discharge 21) and Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 4). Hiniker Air Seeder Cart at Photos 1-3 and 5. ADC2220 at 2-11 and 2-13 (Nos. 5 and 6).
a base mounted on said frame below said main hopper discharge;	Sawby '216 at col. 2, l. 17 (base plate 6). Furrer '817 at col. 4, l. 26 (turret mount 28). Deboffles '667 at Figs. 1-4 (lower end of No. 2). Hiniker Air Seeder Cart at Photos 1 and 3.

a support arm having first and second ends;	Meharry '483 at col. 3, l. 8 and Figs. 1-3 (arm 41). Sawby '216 at col. 2, l. 25 (boom 10). Forsyth '556 at col. 4, l. 24 and Figs. 1 and 2 (crane 16) and col. 7, l. 48 (crane assembly 116) and Fig. 8. Baskerville '044 at col. 4, l. 43 (boom 53). Meyer '814 at col. 2, l. 55 (first arm 40). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hundeby '677 at Figs. 1, 5, and 6 (unnumbered diagonal member supporting No. 15, as shown in Fig. 5). Deboffles '667 at Figs. 1-4 (Nos. 6 and 7). Hiniker Air Seeder Cart at Photos 1-4. ADC2220 at 7-1 (Nos. 15 and 20).

a first coupling connecting said first end of said support arm with said base, said first coupling being rotatable in relation to said base about a first vertical axis of rotation, and said first end of said support arm being rotatable in relation to said first coupling about a first horizontal axis of rotation;	Sawby '216 at col. 2, l. 17 and Figure (sleeve 7). Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Deboffles '667 at Figs. 1-4 (vertical axis X-X). Hiniker Air Seeder Cart at Photos 2 and 3. Other prior showing a first coupling: Meharry '483 at col. 3, l. 12 and Figs. 1-3 (tubular member 45). Forsyth '556 at col. 7, l. 3 and Figs. 1, 2, and 4 (vertical bar 42) and col. 7, l. 33 (first pivot bracket 119) and Fig. 8. Baskerville '044 at col. 4, l. 54 (tube 61). Meyer '814 at col. 2, l. 55 ("first arm 40 is pivotally coupled with frame 12") and Figs. 2 and 3. ADC2220 at 7-1 (structural member (dashed line) to which support arm 20 connects to via shaft 21).

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge; and	Meharry '483 at col. 2, l. 50 (auger arrangement 25). Sawby '216 at col. 2, ll. 48-49 ("The auger . . . includes the casing 17 . . .") and Figure. Forsyth '556 at col. 4, l. 21 (conveyor 10) and col. 7, l. 19 (belt 74). Baskerville '044 at col. 4, ll. 13 and 45 (conveyor 31 and belt 55). Meyer '814 at col. 2, ll. 43-44 (conveyor 32 and belt). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt) and Fig. 3. Hundeby '677 at pg. 4 (auger 15, inlet 16, and discharge 21) and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (No. 8). Hiniker Air Seeder Cart at Photo 1. ADC2220 at 7-1 and 8-1.

a second coupling connecting said second end of said support arm with said conveyor at an approximate center of gravity of said conveyor, said second coupling defining a second vertical axis of rotation that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said second vertical axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper.	Meharry '483 at col. 3, l. 20 (line 51) and col. 1, ll. 11-18 and Figs. 2 and 3. Sawby '216 at col. 2, l. 35 (bracket 16) and col. 3, ll. 4-25 and Figure. Forsyth '556 at col. 7, ll. 11-14 and col. 8, ll. 11-49 and Figs. 1, 2, and 4. Meyer '814 at col. 2, ll. 45-47 and 58 (second arm 42). Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1 (the various components at the end of support arm 15, e.g., No. 18); ADC2220 Publication at 14 ("Dual purpose design allows you to load and unload with the same auger.").
Claim 2	
The seed or grain tender of claim 1, wherein said support arm extends upwardly at an acute angle from said base.	Sawby '216 at col. 2, ll. 32-34 and Figure. Furrer '817 at Figs 1A, 2, 5, and 7 (hydraulic cylinder). Hiniker Air Seeder Cart at Photos 1 and 3. Other prior art showing a support arm: Forsyth '556 at Fig. 2. Baskerville '044 at Fig. 4. Hundeby '677 at Figs. 5 and 6.

Claim 3	
The seed or grain tender of claim 2, wherein said conveyor is parallel to said support arm in said unloading position.	Inherent in light of proposed combination of the load/unload prior art with Furrer '817.
Claim 4	
The seed or grain tender of claim 3, wherein said conveyor is disposed above said support arm in said unloading position.	Inherent in light of proposed combination of the load/unload prior art with Furrer '817. Meharry '483 at Fig. 2. Sawby '216 at Figure. Baskerville '044 at Fig. 4. Hundeby '677 at Figs. 5 and 6. Deboffles '667 at Figs. 2-4. Hiniker Air Seeder Cart at Photo 6.

Claim 5	
The seed or grain tender of claim 1, wherein said conveyor is rotatable in relation to said second coupling about a second horizontal axis of rotation.	Meharry '483 at Figs. 2 and 3. Sawby '216 at col. 2, ll. 40-42. Forsyth '556 at Figs. 1, 2, and 4. Baskerville '044 at col. 4, ll. 42-43 and Figs. 4-7. Meyer '814 at col. 3, ll. 2-8 and Fig. 4. Hundeby '677 at Abstract and Figs. 5 and 6. Hiniker Air Seeder Cart at Photos 4, 6, and 7. ADC2220 at 7-1 (No. 18).
Claim 6	
The seed or grain tender of claim 5, wherein said second horizontal axis of rotation extends through said second coupling.	Sawby '216 at col. 2, ll. 40-42 and Figure. Forsyth '556 at Fig. 4. Baskerville '044 at col. 4, ll. 42-43 and Figs. 4-7. Meyer '814 at col. 3, ll. 2-8 and Fig. 4. Hundeby '677 at Figs. 5 and 6. Hiniker Air Seeder Cart at Photo 4. ADC2220 at 7-1 (No. 18).

Claim 7	
The seed or grain tender of claim 1, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.	Meharry '483 at col. 3, l. 4 (stand 40).
Claim 9	
The seed or grain tender of claim 1, wherein said first vertical axis extends through said base.	Sawby '216 at col. 2, ll. 40-42 and Figure. Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Debofles '667 at Figs. 1-4. Hiniker Air Seeder Cart at Photo 3.

Claim 10	
The seed or grain tender of claim 1, wherein said second end of said support arm terminates at or near said approximate center of gravity of said conveyor.	Meharry '483 at Figs. 2 and 3. Sawby '216 at col. 2, ll. 44-47 and Figure. Forsyth '556 at col. 7, ll. 12-14. Baskerville '044 at Figs. 5 and 9. Meyer '814 at Fig. 2. Hundeby '677 at Figs. 5 and 6. Deboffles '667 at Figs. 1-4. Hiniker Air Seeder Cart at Photos 1, 7, and 8. ADC2220 at 7-1.
Claim 11	
The seed or grain tender of claim 1, wherein said first end of said support arm is fixed at a first height and said second end of said support arm is pivotable between a range of heights.	Sawby '216 at col. 2, ll. 32-34 and Figure. Forsyth '556 at col. 7, ll. 6-10 and 56-63 and Figs. 4 and 8. Baskerville '044 at col. 5, ll. 6-16 and Figs. 4-5. Hiniker Air Seeder Cart at Photos 1, 2, 6, and 7.

Claim 12	
The seed or grain tender of claim 1, further comprising a lift device for adjusting a height of said second end of said support arm.	Meharry '483 at col. 3, l. 18 (winch 50). Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hiniker Air Seeder Cart at Photo 2.
Claim 13	
The seed or grain tender of claim 12, wherein said lift device is a pressurized cylinder.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).
Claim 14	
The seed or grain tender of claim 12, wherein said lift device is a hydraulic cylinder.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).

Claim 16	
The seed or grain tender of claim 1, further comprising a locking mechanism for locking or unlocking said support arm in relation to said base.	Meharry '483 at col. 2, l. 52 (loops 27 and hooks 28). Forsyth '556 at col. 5, l. 44 (support 19) and Fig. 3. Meyer '814 at col. 3, ll. 2-8 and Fig. 1. (In the transport position the conveyor 32 rests in a cradle that locks the conveyor 32 and, therefore, first arm 40 in place. Furrer '817 at Figs. 3 and 5. Hiniker Air Seeder Cart at Photo 8. ADC2220 at 7-1 (Nos. 1-8).
Claim 19	
The seed or grain tender of claim 17, wherein said internal elevator includes a motor-driven belt.	Forsyth '556 at col. 4, l. 68 (motor 75). Baskerville '044 at col. 4, ll. 13, 45, 49 (conveyor 31, belt 55, and drive motor 58). Meyer '814 at col. 2, ll. 43-44 and 50 (conveyor 32, belt, and motor 38). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt and motor 30) and Fig. 3.

Claim 20	
A seed or grain tender comprising:	Meharry '483 at col. 2, l. 35 (gravity bed vehicle 10). Sawby '216 at col. 2, ll. 8-10 (grain handling apparatus 1). Forsyth '556 at col. 4, ll. 15-17. Baskerville '044 at col. 3, l. 53 (seed cart 1). Meyer '814 at col. 2, l. 31 (cart 10). Furrer '817 at col. 3, ll. 41-42 (seed tender). Hundeby '677 at pg. 4 (cart 1). Deboffles '667 at Figs. 1-4 (No. 1). Hiniker Air Seeder Cart at Photo 1. ADC2220 at Cover page.

a frame;	Meharry '483 at Figs. 1-3 (frame 20). Forsyth '556 at col. 4, l. 45 (frame 18). Baskerville '044 at col. 3, l. 55 (lower frame 2). Meyer '814 at col. 2, l. 37 (frame 12). Furrer '817 at col. 4, ll. 5-6 (frame 22). Hundeby '677 at Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 2). Hiniker Air Seeder Cart at Photos 1-3. ADC2220 at 2-1 (No. 1).

a main hopper mounted on said frame and having a main hopper discharge;	Meharry '483 at col. 2, ll. 39 and 46 (gravity bed 21 and opening 12). Sawby '216 at col. 2, ll. 11-12 (grain bins or hopper 2); col. 3, l. 20 (outlet 36). Forsyth '556 at col. 4, l. 29 (compartment 6) and col. 5, l. 20 (ports). Baskerville '044 at col. 3, l. 58 (grain bin 11) and col. 4, ll. 3-4 (discharge opening 25). Meyer '814 at col. 2, l. 34 (first and second tanks 14, 16); col. 2, l. 36 (outlet 20). Furrer '817 at col. 3, ll. 45-46 (seed storage bin 13) and col.4, l. 66–col. 5, l. 4 and Fig. 1A. Hundeby '677 at pg. 4 (tanks 2 and discharge 21) and Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 4). Hiniker Air Seeder Cart at Photos 1-3 and 5. ADC2220 at 2-11 and 2-13 (Nos. 5 and 6).
a base mounted on said frame below said main hopper discharge;	Sawby '216 at col. 2, l. 17 (base plate 6). Furrer '817 at col. 4, l. 26 (turret mount 28). Deboffles '667 at Figs. 1-4 (lower end of No. 2). Hiniker Air Seeder Cart at Photos 1 and 3.

a support arm having first and second ends;	Meharry '483 at col. 3, l. 8 and Figs. 1-3 (arm 41). Sawby '216 at col. 2, l. 25 (boom 10). Forsyth '556 at col. 4, l. 24 and Figs. 1 and 2 (crane 16) and col. 7, l. 48 (crane assembly 116) and Fig. 8. Baskerville '044 at col. 4, l. 43 (boom 53). Meyer '814 at col. 2, l. 55 (first arm 40). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hundeby '677 at Figs. 1, 5, and 6 (unnumbered diagonal element supporting No.15, as shown in Fig. 5). Deboffles '667 at Figs. 1-4 (Nos. 6 and 7). Hiniker Air Seeder Cart at Photos 1-4. ADC2220 at 7-1 (Nos. 15 and 20).

a first coupling connecting said first end of said support arm with said base, said first coupling being rotatable in relation to said base about a first vertical axis of rotation, and said first end of said support arm being rotatable in relation to said first coupling about a first horizontal axis of rotation;	Sawby '216 at col. 2, l. 17 and Figure (sleeve 7). Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Deboffles '667 at Figs. 1-4 (vertical axis X-X). Hiniker Air Seeder Cart at Photos 2 and 3. Other prior showing a first coupling: Meharry '483 at col. 3, l. 12 and Figs. 1-3 (tubular member 45). Forsyth '556 at col. 7, l. 3 and Figs. 1, 2, and 4 (vertical bar 42) and col. 7, l. 33 (first pivot bracket 119) and Fig. 8. Baskerville '044 at col. 4, l. 54 (tube 61). Meyer '814 at col. 2, l. 55 ("first arm 40 is pivotally coupled with frame 12") and Figs. 2 and 3. ADC2220 at 7-1 (structural member (dashed line) to which support arm 20 connects to via shaft 21).
a lift device extending from said base to a portion of said support arm between said first and second ends such that said support arm extends upwardly at an acute angle from said base;	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hiniker Air Seeder Cart at Photo 2. Other prior art showing a lift device: Meharry '483 at col. 3, l. 18 (winch 50). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64) and Fig. 4.

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and a motor-driven elevator for moving seed or grain from said conveyor hopper to said conveyor discharge; and	Meharry '483 at col. 2, l. 50 (auger arrangement 25). Sawby '216 at col. 2, ll. 48-49 ("The auger . . . includes the casing 17 . . .") and Figure. Forsyth '556 at col. 4, l. 21 (conveyor 10) and col. 7, l. 19 (belt 74) and col. 3, l. 58 (motor 75). Baskerville '044 at col. 4, ll. 13, 45, and 49 (conveyor 31, belt 55, and motor 58). Meyer '814 at col. 2, ll. 43-44 and 50 (conveyor 32, belt, and motor 38). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt and motor 30) and Fig. 3. Hundeby '677 at pg. 4 (auger 15, inlet 16, and discharge 17) and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (No. 8). Hiniker Air Seeder Cart at Photo 1. ADC2220 at 7-1 and 8-1.

a second coupling connecting said second end of said support arm with said conveyor at an approximate center of gravity of said conveyor, said second coupling defining a second vertical axis of rotation that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said second vertical axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper, wherein said conveyor is disposed parallel to and above said support arm in said unloading position; and	Meharry '483 at col. 3, l. 20 (line 51) and col. 1, ll. 11-18 and Figs. 2 and 3. Sawby '216 at col. 2, l. 35 (bracket 16) and col. 3, ll. 4-25 and Figure. Forsyth '556 at col. 7, ll. 11-14 and col. 8, ll. 11-49 and Figs. 1, 2, and 4. Meyer '814 at col. 2, ll. 45-47 and 58 (second arm 42). Hundeby '677 at Abstract and Figs. 5 and 6. Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1 (the various components at the end of support arm 15, e.g., No. 18); ADC2220 Publication at 14 ("Dual purpose design allows you to load and unload with the same auger.").
a locking mechanism for locking and unlocking said support arm in relation to said base.	Meharry '483 at col. 2, l. 52 (loops 27 and hooks 28). Forsyth '556 at col. 5, l. 44 (support 19) and Fig. 3. Meyer '814 at col. 3, ll. 2-8 and Fig. 1. In the transport position the conveyor 32 rests in a cradle that locks the conveyor 32 and, therefore, first arm 40 in place. Furrer '817 at Figs. 3 and 5. Hiniker Air Seeder Cart at Photo 8. ADC2220 at 7-1 (Nos. 1-8).

Claim 21	
The seed or grain tender of claim 20, wherein said conveyor is disposed above said support arm in said unloading position.	Inherent in light of proposed combination of the load/unload prior art with Furrer '817. Meharry '483 at Fig. 2. Sawby '216 at Figure. Baskerville '044 at Fig. 4. Hundeby '677 at Figs. 5 and 6. Deboffles '667 at Figs. 2-4. Hiniker Air Seeder Cart at Photo 6.
Claim 22	
The seed or grain tender of claim 20, wherein said conveyor is rotatable in relation to said second coupling about a second horizontal axis of rotation.	Meharry '483 at Figs. 2 and 3. Sawby '216 at col. 2, ll. 40-42. Forsyth '556 at Figs. 1, 2, and 4. Baskerville '044 at col. 4, ll. 42-43 and Figs. 4-7. Meyer '814 at col. 3, ll. 2-8 and Fig. 4. Hundeby '677 at Abstract and Figs. 5 and 6. Hiniker Air Seeder Cart at Photos 4, 6, and 7. ADC2220 at 7-1 (No. 18).

Claim 23	
The seed or grain tender of claim 22, wherein said second horizontal axis of rotation extends through said second coupling.	Sawby '216 at col. 2, ll. 40-42 and Figure. Forsyth '556 at Fig. 4. Baskerville '044 at col. 4, ll. 42-43 and Figs. 4-7. Meyer '814 at col. 3, ll. 2-8 and Fig. 4. Hundeby '677 at Figs. 5 and 6. Hiniker Air Seeder Cart at Photo 4. ADC2220 at 7-1 (No. 18).
Claim 26	
The seed or grain tender of claim 20, wherein said first vertical axis extends through said base.	Sawby '216 at col. 2, ll. 40-42 and Figure. Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Deboffles '667 at Figs. 1-4 (vertical axis X-X). Hiniker Air Seeder Cart at Photo 3.

Claim 27	
The seed or grain tender of claim 20, wherein said second end of said support arm terminates at or near said approximate center of gravity of said conveyor.	Meharry '483 at Figs. 2 and 3. Sawby '216 at col. 2, ll. 44-47 and Figure. Forsyth '556 at col. 7, ll. 12-14. Baskerville '044 at Figs. 5 and 9. Meyer '814 at Fig. 2. Hundeby '677 at Figs. 5 and 6. Deboffles '667 at Figs. 1-4. Hiniker Air Seeder Cart at Photos 1, 7, and 8. ADC2220 at 7-1.
Claim 28	
The seed or grain tender of claim 20, wherein said first end of said support arm is fixed at a first height and said second end of said support arm is pivotable between a range of heights.	Sawby '216 at col. 2, ll. 32-34 and Figure. Forsyth '556 at col. 7, ll. 6-10 and 56-63 and Figs. 4 and 8. Baskerville '044 at col. 5, ll. 6-16 and Figs. 4-5. Hiniker Air Seeder Cart at Photos 1, 2, 6, and 7.

Claim 29	
The seed or grain tender of claim 20, wherein said lift device is a pressurized cylinder.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).
Claim 30	
The seed or grain tender of claim 20, wherein said lift device is a hydraulic cylinder.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).
Claim 34	
The seed or grain tender of claim 20, wherein said internal elevator includes a motor-driven belt.	Forsyth '556 at col. 4, l. 68 (motor 75). Baskerville '044 at col. 4, ll. 13, 45, and 49 (conveyor 31, belt 55, and motor 58). Meyer '814 at col. 2, ll. 43-44 and 50 (conveyor 32, belt, and motor 38). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt and motor 30) and Fig. 3.

U.S. Patent No. 8,967,940

Claim 1	References
A seed or grain tender comprising:	Meharry '483 at col. 2, l. 35 (gravity bed vehicle 10). Sawby '216 at col. 2, ll. 8-10 (grain handling apparatus 1). Forsyth '556 at col. 4, ll. 15-17. Baskerville '044 at col. 3, l. 53 (seed cart 1). Meyer '814 at col. 2, l. 31 (cart 10). Furrer '817 at col. 3, ll. 41-42 (seed tender). Hundeby '677 at pg. 4 (cart 1). Deboffles '667 at Figs. 1-4 (No. 1). Hiniker Air Seeder Cart at Photo 1. ADC2220 at Cover page.

a frame;	Meharry '483 at Figs. 1-3 (frame 20). Forsyth '556 at col. 4, l. 45 (frame 18). Baskerville '044 at col. 3, l. 55 (lower frame 2). Meyer '814 at col. 2, l. 37 (frame 12). Furrer '817 at col. 4, ll. 5-6 (frame 22). Hundeby '677 at Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 2). Hiniker Air Seeder Cart at Photos 1-3. ADC2220 at 2-1 (No. 1).

a main hopper mounted on said frame and having a main hopper discharge;	Meharry '483 at col. 2, ll. 39 and 46 (gravity bed 21 and opening 12). Sawby '216 at col. 2, ll. 11-12 (grain bins or hopper 2); col. 3, l. 20 (outlet 36). Forsyth '556 at col. 4, l. 29 (compartment 6) and col. 5, l. 20 (ports). Baskerville '044 at col. 3, l. 58 (grain bin 11) and col. 4, ll. 3-4 (discharge opening 25). Meyer '814 at col. 2, l. 34 (first and second tanks 14, 16); col. 2, l. 36 (outlet 20). Furrer '817 at col. 3, ll. 45-46 (seed storage bin 13) and col.4, l. 66--col. 5, l. 4 and Fig. 1A. Hundeby '677 at pg. 4 (tanks 2 and discharge 21) and Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 4). Hiniker Air Seeder Cart at Photos 1-3 and 5. ADC2220 at 2-11 and 2-13 (Nos. 5 and 6).
a base mounted below said main hopper discharge;	Sawby '216 at col. 2, l. 17 (base plate 6). Furrer '817 at col. 4, l. 26 (turret mount 28). Deboffles '667 at Figs. 1-4 (lower end of No. 2). Hiniker Air Seeder Cart at Photos 1 and 3.

a support arm having first and second ends;	Meharry '483 at col. 3, l. 8 and Figs. 1-3 (arm 41). Sawby '216 at col. 2, l. 25 (boom 10). Forsyth '556 at col. 4, l. 24 and Figs. 1 and 2 (crane 16) and col. 7, l. 48 (crane assembly 116) and Fig. 8. Baskerville '044 at col. 4, l. 43 (boom 53). Meyer '814 at col. 2, l. 55 (first arm 40). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hundeby '677 at Figs. 1, 5, and 6 (unnumbered diagonal member supporting No. 15, as shown in Fig. 5). Deboffles '667 at Figs. 1-4 (Nos. 6 and 7). Hiniker Air Seeder Cart at Photos 1-4. ADC2220 at 7-1 (Nos. 15 and 20).

a first coupling connecting said first end of said support arm with said base, said first coupling being rotatable in relation to said base about a first vertical axis of rotation, and said first end of said support arm being rotatable in relation to said first coupling about a first horizontal axis of rotation;	Sawby '216 at col. 2, l. 17 and Figure (sleeve 7). Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Deboffles '667 at Figs. 1-4 (vertical axis X-X). Hiniker Air Seeder Cart at Photos 2 and 3. Other prior showing a first coupling: Meharry '483 at col. 3, l. 12 and Figs. 1-3 (tubular member 45). Forsyth '556 at col. 7, l. 3 and Figs. 1, 2, and 4 (vertical bar 42) and col. 7, l. 33 (first pivot bracket 119) and Fig. 8. Baskerville '044 at col. 4, l. 54 (tube 61). Meyer '814 at col. 2, l. 55 ("first arm 40 is pivotally coupled with frame 12") and Figs. 2 and 3. ADC2220 at 7-1 (structural member (dashed line) to which support arm 20 connects to via shaft 21).

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge; and	Meharry '483 at col. 2, l. 50 (auger arrangement 25). Sawby '216 at col. 2, ll. 48-49 ("The auger . . . includes the casing 17 . . .") and Figure. Forsyth '556 at col. 4, l. 21 (conveyor 10) and col. 7, l. 19 (belt 74). Baskerville '044 at col. 4, ll. 13 and 45 (conveyor 31 and belt 55). Meyer '814 at col. 2, ll. 43-44 (conveyor 32 and belt). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt) and Fig. 3. Hundeby '677 at pg. 4 (auger 15, inlet 16, and discharge 17) and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (No. 8). Hiniker Air Seeder Cart at Photo 1. ADC2220 at 7-1 and 8-1.

a second coupling connecting said second end of said support arm with said conveyor at an approximate center of gravity of said conveyor, said second coupling defining a second vertical axis of rotation that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said second vertical axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper.	Meharry '483 at col. 3, l. 20 (line 51) and col. 1, ll. 11-18 and Figs. 2 and 3. Sawby '216 at col. 2, l. 35 (bracket 16) and col. 3, ll. 4-25 and Figure. Forsyth '556 at col. 7, ll. 11-14 and col. 8, ll. 11-49 and Figs. 1, 2, and 4. Meyer '814 at col. 2, ll. 45-47 and 58 (second arm 42). Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1 (the various components at the end of support arm 15, e.g., No. 18); ADC2220 Publication at 14 ("Dual purpose design allows you to load and unload with the same auger.").
Claim 2	
The seed or grain tender of claim 1, wherein said first vertical axis of rotation extends through said main hopper discharge.	Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7.

Claim 3	
The seed or grain tender of claim 1, wherein said second vertical axis of rotation extends through said approximate center of gravity of said conveyor.	Meharry '483 at Fig. 2. Sawby '216 at Figure. Forsyth '556 at col. 7, ll. 12-14. Meyer '814 at Figs. 2-4. Hundeby '677 at Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1.
Claim 5	
The seed or grain tender of claim 1, wherein said second end of said support arm terminates at or near said second coupling.	Meharry '483 at Fig. 2. Sawby '216 at col. 2, ll. 44-47 and Figure. Forsyth '556 at col. 7, ll. 12-14 and Fig. 4. Baskerville '044 at Figs. 4 and 5. Meyer '814 at Figs. 2 and 3. Deboffles '667 at Figs. 1-4. Hiniker Air Seeder Cart at Photos 1 and 4. ADC2220 at 7-1.

Claim 6	
The seed or grain tender of claim 1, further comprising a hydraulic piston extending at an acute angle relative to a horizontal plane to connect with a portion of said support arm spaced from said first horizontal axis of rotation.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).
Claim 7	
The seed or grain tender of claim 1, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.	Meharry '483 at col. 3, l. 4 (stand 40).

Claim 8	
A seed or grain tender comprising:	Meharry '483 at col. 2, l. 35 (gravity bed vehicle 10). Sawby '216 at col. 2, ll. 8-10 (grain handling apparatus 1). Forsyth '556 at col. 4, ll. 15-17. Baskerville '044 at col. 3, l. 53 (seed cart 1). Meyer '814 at col. 2, l. 31 (cart 10). Furrer '817 at col. 3, ll. 41-42 (seed tender). Hundeby '677 at pg. 4 (cart 1). Deboffles '667 at Figs. 1-4 (No. 1). Hiniker Air Seeder Cart at Photo 1. ADC2220 at Cover page.

a frame;	Meharry '483 at Figs. 1-3 (frame 20). Forsyth '556 at col. 4, l. 45 (frame 18). Baskerville '044 at col. 3, l. 55 (lower frame 2). Meyer '814 at col. 2, l. 37 (frame 12). Furrer '817 at col. 4, ll. 5-6 (frame 22). Hundeby '677 at Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 2). Hiniker Air Seeder Cart at Photos 1-3. ADC2220 at 2-1 (No. 1).

a main hopper mounted on said frame and having a main hopper discharge;	Meharry '483 at col. 2, ll. 39 and 46 (gravity bed 21 and opening 12). Sawby '216 at col. 2, ll. 11-12 (grain bins or hopper 2); col. 3, l. 20 (outlet 36). Forsyth '556 at col. 4, l. 29 (compartment 6) and col. 5, l. 20 (ports). Baskerville '044 at col. 3, l. 58 (grain bin 11) and col. 4, ll. 3-4 (discharge opening 25). Meyer '814 at col. 2, l. 34 (first and second tanks 14, 16); col. 2, l. 36 (outlet 20). Furrer '817 at col. 3, ll. 45-46 (seed storage bin 13) and col.4, l. 66–col. 5, l. 4 and Fig. 1A. Hundeby '677 at pg. 4 (tanks 2 and discharge 21) and Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 4). Hiniker Air Seeder Cart at Photos 1-3 and 5. ADC2220 at 2-11 and 2-13 (Nos. 5 and 6).
a base positioned below said main hopper;	Sawby '216 at col. 2, l. 17 (base plate 6). Furrer '817 at col. 4, l. 26 (turret mount 28). Deboffles '667 at Figs. 1-4 (lower end of No. 2). Hiniker Air Seeder Cart at Photos 1 and 3.

a support arm having first and second ends;	Meharry '483 at col. 3, l. 8 and Figs. 1-3 (arm 41). Sawby '216 at col. 2, l. 25 (boom 10). Forsyth '556 at col. 4, l. 24 and Figs. 1 and 2 (crane 16) and col. 7, l. 48 (crane assembly 116) and Fig. 8. Baskerville '044 at col. 4, l. 43 (boom 53). Meyer '814 at col. 2, l. 55 (first arm 40). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hundeby '677 at Figs. 1, 5, and 6 (unnumbered diagonal member supporting No. 15, as shown in Fig. 5). Deboffles '667 at Figs. 1-4 (Nos. 6 and 7). Hiniker Air Seeder Cart at Photos 1-4. ADC2220 at 7-1(Nos. 15 and 20).

a first coupling connecting said first end of said support arm with said base, said first coupling being rotatable about a first vertical axis of rotation, and said first end of said support arm being rotatable about a first horizontal axis of rotation;	Sawby '216 at col. 2, l. 17 and Figure (sleeve 7). Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Deboffles '667 at Figs. 1-4 (vertical axis X-X). Hiniker Air Seeder Cart at Photos 2 and 3. Other prior showing a first coupling: Meharry '483 at col. 3, l. 12 and Figs. 1-3 (tubular member 45). Forsyth '556 at col. 7, l. 3 and Figs. 1, 2, and 4 (vertical bar 42) and col. 7, l. 33 (first pivot bracket 119) and Fig. 8. Baskerville '044 at col. 4, l. 54 (tube 61). Meyer '814 at col. 2, l. 55 ("first arm 40 is pivotally coupled with frame 12") and Figs. 2 and 3. ADC2220 at 7-1 (structural member (dashed line) to which support arm 20 connects to via shaft 21).

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, and a conveyor discharge at said second end; and	Meharry '483 at col. 2, l. 50 (auger arrangement 25). Sawby '216 at col. 2, ll. 48-49 ("The auger . . . includes the casing 17 . . .") and Figure. Forsyth '556 at col. 4, l. 21 (conveyor 10). Baskerville '044 at col. 4, l. 13 (conveyor 31). Meyer '814 at col. 2, l. 43 (conveyor 32). Furrer '817 at col. 3, l. 43 (conveyor 11) and Fig. 3. Hundeby '677 at pg. 4 (auger 15, inlet 16, and discharge 17) and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (No. 8). Hiniker Air Seeder Cart at Photo 1. ADC2220 at 7-1 and 8-1.

a second coupling connecting said second end of said support arm with said conveyor at an approximate center of gravity of said conveyor, said second coupling defining a second vertical axis of rotation that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable about said second vertical axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper.	Meharry '483 at col. 3, l. 20 (line 51) and col. 1, ll. 11-18 and Figs. 2 and 3. Sawby '216 at col. 2, l. 35 (bracket 16) and col. 3, ll. 4-25 and Figure. Forsyth '556 at col. 7, ll. 11-14 and col. 8, ll. 11-49 and Figs. 1, 2, and 4. Meyer '814 at col. 2, ll. 45-47 and 58 (second arm 42). Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1 (the various components at the end of support arm 15, e.g., No. 18); ADC2220 Publication at 14 ("Dual purpose design allows you to load and unload with the same auger.").
Claim 9	
The seed or grain tender of claim 8, wherein said first vertical axis of rotation extends through said main hopper discharge.	Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7.

Claim 10	
The seed or grain tender of claim 8, wherein said second vertical axis of rotation extends through said approximate center of gravity of said conveyor.	Meharry '483 at Fig. 2. Sawby '216 at Figure. Forsyth '556 at col. 7, ll. 12-14. Meyer '814 at Figs. 2 and 3. Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1.

Claim 12	
The seed or grain tender of claim 8, wherein said second end of said support arm terminates at or near said second coupling.	Meharry '483 at Fig. 2. Sawby '216 at col. 2, ll. 44-47 and Figure. Forsyth '556 at col. 7, ll. 12-14 and Fig. 4. Baskerville '044 at Figs. 4 and 5. Meyer '814 at col. 2, ll. 43-44 (conveyor 32 and belt). Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4. Hiniker Air Seeder Cart at Photos 1 and 4. ADC2220 at 7-1.
Claim 13	
The seed or grain tender of claim 8, wherein said conveyor includes an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge.	Forsyth '556 at col. 7, l. 19 (belt 74). Baskerville '044 at col. 4, ll. 13 and 45 (conveyor 31 and belt 55). Meyer '814 at col. 2, ll. 43-44 (conveyor 32 and belt). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt) and Fig. 3.

Claim 14	Accused Instrumentalities
The seed or grain tender of claim 8, further comprising a hydraulic piston extending at an acute angle relative to a horizontal plane to connect with a portion of said support arm spaced from said first horizontal axis of rotation.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).
Claim 15	
The seed or grain tender of claim 8, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.	Meharry '483 at col. 3, l. 4 (stand 40).

Claim 16	
A seed or grain tender comprising:	Meharry '483 at col. 2, l. 35 (gravity bed vehicle 10). Sawby '216 at col. 2, ll. 8-10 (grain handling apparatus 1). Forsyth '556 at col. 4, ll. 15-17. Baskerville '044 at col. 3, l. 53 (seed cart 1). Meyer '814 at col. 2, l. 31 (cart 10). Furrer '817 at col. 3, ll. 41-42 (seed tender). Hundeby '677 at pg. 4 (cart 1). Deboffles '667 at Figs. 1-4 (No. 1). Hiniker Air Seeder Cart at Photo 1. ADC2220 at Cover page.

a main hopper having a main hopper discharge;	Meharry '483 at col. 2, ll. 39 and 46 (gravity bed 21 and opening 12). Sawby '216 at col. 2, ll. 11-12 (grain bins or hopper 2); col. 3, l. 20 (outlet 36). Forsyth '556 at col. 4, l. 29 (compartment 6) and col. 5, l. 20 (ports). Baskerville '044 at col. 3, l. 58 (grain bin 11) and col. 4, ll. 3-4 (discharge opening 25). Meyer '814 at col. 2, l. 34 (first and second tanks 14, 16); col. 2, l. 36 (outlet 20). Furrer '817 at col. 3, ll. 45-46 (seed storage bin 13) and col.4, l. 66–col. 5, l. 4 and Fig. 1A. Hundeby '677 at pg. 4 (tanks 2 and discharge 21) and Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 4). Hiniker Air Seeder Cart at Photos 1-3 and 5. ADC2220 at 2-11 and 2-13 (Nos. 5 and 6).
a base positioned below said main hopper;	Sawby '216 at col. 2, l. 17 (base plate 6). Furrer '817 at col. 4, l. 26 (turret mount 28). Deboffles '667 at Figs. 1-4 (lower end of No. 2). Hiniker Air Seeder Cart at Photos 1 and 3.

a support arm having first and second ends;	Meharry '483 at col. 3, l. 8 and Figs. 1-3 (arm 41). Sawby '216 at col. 2, l. 25 (boom 10). Forsyth '556 at col. 4, l. 24 and Figs. 1 and 2 (crane 16) and col. 7, l. 48 (crane assembly 116) and Fig. 8. Baskerville '044 at col. 4, l. 43 (boom 53). Meyer '814 at col. 2, l. 55 (first arm 40). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hundeby '677 at Figs. 1, 5, and 6 (unnumbered diagonal member supporting No. 15, as shown in Fig. 5). Deboffles '667 at Figs. 1-4 (Nos. 6 and 7). Hiniker Air Seeder Cart at Photos 1-4. ADC2220 at 7-1(Nos. 15 and 20).

first coupling connecting said first end of said support arm with said base, said first coupling being rotatable about a first vertical axis of rotation, and said first end of said support arm being rotatable about a first horizontal axis of rotation;	Sawby '216 at col. 2, l. 17 and Figure (sleeve 7). Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Deboffles '667 at Figs. 1-4 (vertical axis X-X). Hiniker Air Seeder Cart at Photos 2 and 3. Other prior showing a first coupling: Meharry '483 at col. 3, l. 12 and Figs. 1-3 (tubular member 45). Forsyth '556 at col. 7, l. 3 and Figs. 1, 2, and 4 (vertical bar 42) and col. 7, l. 33 (first pivot bracket 119) and Fig. 8. Baskerville '044 at col. 4, l. 54 (tube 61). Meyer '814 at col. 2, l. 55 ("first arm 40 is pivotally coupled with frame 12") and Figs. 2 and 3. ADC2220 at 7-1 (structural member (dashed line) to which support arm 20 connects to via shaft 21).

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, and a conveyor discharge at said second end; and	Meharry '483 at col. 2, l. 50 (auger arrangement 25). Sawby '216 at col. 2, ll. 48-49 ("The auger . . . includes the casing 17 . . .") and Figure. Forsyth '556 at col. 4, l. 21 (conveyor 10). Baskerville '044 at col. 4, l. 13 (conveyor 31). Meyer '814 at col. 2, l. 43 (conveyor 32). Furrer '817 at col. 3, l. 43 (conveyor 11) and Fig. 3. Hundeby '677 at pg. 4 (auger 15, inlet 16, and discharge 17) and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (No. 8). Hiniker Air Seeder Cart at Photo 1. ADC2220 at 7-1 and 8-1.

a second coupling connecting said second end of said support arm with said conveyor at an approximate center of gravity of said conveyor, said second coupling defining a first conveyor axis of rotation that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable about said first conveyor axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper.	Meharry '483 at col. 3, l. 20 (line 51) and col. 1, ll. 11-18 and Figs. 2 and 3. Sawby '216 at col. 2, l. 35 (bracket 16) and col. 3, ll. 4-25 and Figure. Forsyth '556 at col. 7, ll. 11-14 and col. 8, ll. 11-49 and Figs. 1, 2, and 4. Meyer '814 at col. 2, ll. 45-47 and 58 (second arm 42). Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1 (the various components at the end of support arm 15, e.g., No. 18); ADC2220 Publication at 14 ("Dual purpose design allows you to load and unload with the same auger.").
Claim 17	
The seed or grain tender of claim 16, wherein said first vertical axis of rotation extends through said main hopper discharge.	Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7.

Claim 18	
The seed or grain tender of claim 16, wherein said first conveyor axis of rotation extends through said approximate center of gravity of said conveyor.	Meharry '483 at Fig. 2. Sawby '216 at Figure. Forsyth '556 at col. 7, ll. 12-14. Meyer '814 at Figs. 2 and 3. Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1.

Claim 20	
The seed or grain tender of claim 16, wherein said second end of said support arm terminates at or near said second coupling.	Meharry '483 at Fig. 2. Sawby '216 at col. 2, ll. 44-47 and Figure. Forsyth '556 at col. 7, ll. 12-14 and Fig. 4. Baskerville '044 at Figs. 4 and 5. Meyer '814 at Figs. 2 and 3. Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4. Hiniker Air Seeder Cart at Photos 1 and 4. ADC2220 at 7-1.
Claim 21	
The seed or grain tender of claim 16, wherein said conveyor includes an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge.	Forsyth '556 at col. 7, l. 19 (belt 74). Baskerville '044 at col. 4, ll. 13 and 45 (conveyor 31 and belt 55). Meyer '814 at col. 2, ll. 43-44 (conveyor 32 and belt). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt) and Fig. 3.

Claim 22	
The seed or grain tender of claim 16, further comprising a hydraulic piston extending at an acute angle relative to a horizontal plane to connect with a portion of said support arm spaced from said first horizontal axis of rotation.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).
Claim 23	
The seed or grain tender of claim 16, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.	Meharry '483 at col. 3, l. 4 (stand 40).

Electronic Patent Application Fee Transmittal	
Application Number:	14606794
Filing Date:	27-Jan-2015
Title of Invention:	SEED CARRIER WITH PIVOTING CONVEYOR
First Named Inventor/Applicant Name:	Brian James PETERSEN
Filer:	George R. Repper/Marilyn Davis
Attorney Docket Number:	1994-363US2
Filed as Large Entity	
Filing Fees for Utility under 35 USC 111(a)	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
			Total in USD ($)	**180**

Transaction History Date 2017-07-06
Date information retrieved from USPTO Patent Application Information Retrieval (PAIR) system records at www.uspto.gov

Notice of Allowability	Application No. 14/606,794	Applicant(s) PETERSEN ET AL.	
	Examiner WILLIE BERRY JR	Art Unit 3652	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *4/26/17*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *39-46 and 48-60*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   Certified copies:
   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____.
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/SAUL RODRIGUEZ/
Supervisory Patent Examiner, Art Unit 3652

U.S. Patent and Trademark Office
PTOL-37 (Rev. 08-13)
20170626

Notice of Allowability Part of Paper No./Mail Date

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14606794
	Filing Date	2015-01-27
	First Named Inventor	Brian James PETERSEN
	Art Unit	3652
	Examiner Name	Willie Wendell Berry Jr.
	Attorney Docket Number	1994-363.US2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/George R. Repper/	Date (YYYY-MM-DD)	2017-04-26
Name/Print	George R. Repper	Registration Number	31,414

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Receipt date: 04/26/2017 14606794 - GAU: 3652

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	14606794
Filing Date	2015-01-27
First Named Inventor	Brian James PETERSEN
Art Unit	3652
Examiner Name	Willie Wendell Berry Jr.
Attorney Docket Number	1994-363.US2

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2465667	FR	A1	1981-03-27	DEBOFFLES, Regis		X
	2	2416677	CA	A1	2004-08-13	HUNDEBY, David R.		☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14606794
	Filing Date	2015-01-27
	First Named Inventor	Brian James PETERSEN
	Art Unit	3652
	Examiner Name	Willie Wendell Berry Jr.
	Attorney Docket Number	1994-363.US2

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Hiniker Company, Model 4836 Air Seeder Cart with 4800 Air Drill Front Folding Toolbar, Operator's Manual, January 1999, 58 pages.	
	2	Hiniker Company, Models 4831, 4832, and 4833 Air Seeder Cart with 4800 Air Seeder Front Folding Toolbar, Assembly Manual, January 2000, 49 pages.	
	3	Hiniker 4831, 4832, 4833 Air Seeder, July 21, 1999, 1 page.	
	4	Hiniker Company, Fill Auger Support Assembly, 1 page.	
	5	Hiniker Company, 4800 Soybean Planter Marketing Material, 6 pages.	
	6	Hiniker Company, Product Photographs, 67 pages.	
	7	J&M Manufacturing Company, Inc., Annotated Photographs of Hiniker Company 4836 Air Seed Cart, 8 pages.	
	8	Great Plains Manufacturing, 220 Bushel Air Cart, 2 pages.	
	9	J&M Manufacturing Company, Inc., J&M Mfg. Co., Inc.'s Amended Initial Invalidity Contentions submitted in Unverferth Mfg. Co., Inc. v. J&M Mfg. Co., Inc., Civil Action No. 3:16-cv-02282-JZ (N.D. Ohio), February 7, 2017, 59 pages.	

If you wish to add additional non-patent literature document citation information please click the Add button Add

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14606794
	Filing Date	2015-01-27
	First Named Inventor	Brian James PETERSEN
	Art Unit	3652
	Examiner Name	Willie Wendell Berry Jr.
	Attorney Docket Number	1994-363.US2

EXAMINER SIGNATURE			
Examiner Signature	/WILLIE W BERRY JR/	Date Considered	06/26/2017

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

6449 7590 07/06/2017
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

EXAMINER
BERRY JR, WILLIE WENDELL

ART UNIT	PAPER NUMBER
3652	

DATE MAILED: 07/06/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/606,794	01/27/2015	Brian James PETERSEN	1994-363US2	1047

TITLE OF INVENTION: SEED CARRIER WITH PIVOTING CONVEYOR

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	10/06/2017

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

6449 7590 07/06/2017
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/606,794	01/27/2015	Brian James PETERSEN	1994-363US2	1047

TITLE OF INVENTION: SEED CARRIER WITH PIVOTING CONVEYOR

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	10/06/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
BERRY JR, WILLIE WENDELL	3652	414-523000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____ 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/606,794	01/27/2015	Brian James PETERSEN	1994-363US2	1047

6449 7590 07/06/2017
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

EXAMINER	
BERRY JR, WILLIE WENDELL	

ART UNIT	PAPER NUMBER
3652	

DATE MAILED: 07/06/2017

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt	
EFS ID:	29773311
Application Number:	14606794
International Application Number:	
Confirmation Number:	1047
Title of Invention:	SEED CARRIER WITH PIVOTING CONVEYOR
First Named Inventor/Applicant Name:	Brian James PETERSEN
Customer Number:	6449
Filer:	George R. Repper/Cindy Brooks
Filer Authorized By:	George R. Repper
Attorney Docket Number:	1994-363US2
Receipt Date:	13-JUL-2017
Filing Date:	27-JAN-2015
Time Stamp:	14:37:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$960
RAM confirmation Number	071417INTEFSW00000882022135
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Issue_Fee_1994-362-US2.pdf	133883	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30555	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	164438		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
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or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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6449 7590 07/06/2017
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607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/606,794	01/27/2015	Brian James PETERSEN	1994-363US2	1047

TITLE OF INVENTION: SEED CARRIER WITH PIVOTING CONVEYOR

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	10/06/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
BERRY JR, WILLIE WENDELL	3652	414-523000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Rothwell, Figg, Ernst & Manbeck, P.C.
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: UNVERFERTH MANUFACTURING COMPANY, INC.
(B) RESIDENCE: (CITY and STATE OR COUNTRY): Kalida, OH

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 02-2135 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /George R. Repper/ Date July 13, 2017
Typed or printed name George R. Repper Registration No. 31,414

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal	
Application Number:	14606794
Filing Date:	27-Jan-2015
Title of Invention:	SEED CARRIER WITH PIVOTING CONVEYOR
First Named Inventor/Applicant Name:	Brian James PETERSEN
Filer:	George R. Repper/Cindy Brooks
Attorney Docket Number:	1994-363US2
Filed as Large Entity	

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	960

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/606,794	08/29/2017	9745123	1994-363US2	1047

6449 7590 08/09/2017

ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 305 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Brian James PETERSEN, Ottawa, OH;
UNVERFERTH MANUFACTURING COMPANY, INC., Kalida, OH;
David Richard SMITH, Fort Jennings, OH;

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AO 120 (Rev. 08/10)

TO:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the District of North Dakota on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
3:18-cv-053	3/12/2018	for the District of North Dakota

PLAINTIFF	DEFENDANT
Unverferth Mfg. Co., Inc.	Norwood Sales Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,221,047	7/17/2012	Unverferth Mfg. Co., Inc.
2	8,967,940	3/3/2015	Unverferth Mfg. Co., Inc.
3	9,745,123	8/29/2017	Unverferth Mfg. Co., Inc.
4			
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
Robert Ansley	/s/ Ashley Sanders	3/12/2018

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Northern District of Iowa on the following

G Trademarks or ☑ Patents. (G the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
5:19-cv-4005	1/23/2019	Northern District of Iowa

PLAINTIFF	DEFENDANT
Unverferth Mfg. Co., Inc.	Meridian Mfg., Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,221,047	7/17/2012	Unverferth
2	8,967,940	3/3/2015	Unverferth
3	9,745,123	8/29/2017	Unverferth
4			
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY G Amendment G Answer G Cross Bill G Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
Robert L. Phelps, Clerk of Court	/s/Paul A. Coberly, Deputy Clerk	1/24/2019

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

File History Content Report

The following content is missing from the original file history record obtained from the United States Patent and Trademark Office. No additional information is available.

Document Date - 2021-02-18

Document Title - Applicant Communication Re: Payment of Maintenance Fee, 4th Year, Large Entity

This page is not part of the official USPTO record. It has been determined that content identified on this document is missing from the original file history record.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/606,794	Filing Date 01/27/2015	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	05/11/2015	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 22	Minus	** 38	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SLIE
/HELENA PAYTON/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/606,794

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	38 minus 20=	* 18			OR	x 80 =	1440
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	3040

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/606,794

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	38 minus 20=	* 18			OR	x 80 =	1440
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	3040

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/606,794	Filing Date 01/27/2015	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	38 minus 20 =	* 18	X $80 =	1440
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	* 0	X $420 =	0
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	1440

APPLICATION AS AMENDED – PART II

AMENDMENT	04/26/2017	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 38	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
GERALDINE STANLEY

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Derwent Innovation Patent Export, 2024-08-29 00:40:36 +0000

Search results for: PNS=(US9745123);
Collections searched: DWPI; ARIPO grant; Argentina UM; Argentina app; Armenia grant; Australia UM; Australia app; Australia grant; Austria UM; Austria app; Austria grant; Belarus UM; Belarus grant; Belgium app; Belgium grant; Brazil UM; Brazil app; Brazil grant; Bulgaria UM; Bulgaria app; Bulgaria grant; Canada app; Canada grant; China, Mainland UM; China, Mainland app; China, Mainland grant; Colombia app; Costa Rica UM; Costa Rica app; Croatia UM; Croatia app; Croatia grant; Cuba app; Cuba grant; Czech Republic UM; Czech Republic app; Czech Republic grant; Czechoslovakia grant; Denmark UM; Denmark app; Denmark grant; Estonia UM; Estonia app; Estonia grant; Eurasian (EAPO) grant; Europe (EP) app; Europe (EP) grant; Finland app; Finland grant; France app; France grant; Georgia grant; German Democratic Republic app; German Democratic Republic grant; Germany UM; Germany app; Germany grant; Greece app; Greece grant; Gulf Cooperation Council grant; Hong Kong UM; Hong Kong app; Hong Kong grant; Hungary grant; Iceland grant; India app; India grant; Indonesia UM; Indonesia app; Ireland UM; Ireland app; Ireland grant; Israel grant; Italy grant; Italy grant; Italy grant; Italy grant; Japan UM; Japan app; Japan grant; Korea UM; Korea app; Korea grant; Latvia grant; Lithuania grant; Luxembourgh app; Luxembourgh grant; Malaysia app; Malaysia grant; Mexico app; Mexico grant; Moldova UM; Moldova grant; Monaco grant; Mongolia UM; Mongolia grant; Morocco app; Morocco grant; Netherlands app; Netherlands grant; New Zealand grant; Norway app; Norway grant; OAPI grant; PCT (WO) app; Philippines UM; Philippines app; Philippines grant; Poland UM; Poland grant; Portugal UM; Portugal app; Portugal grant; Romania UM; Romania app; Romania granted; Russia UM; Russia app; Russia grant; Saudi Arabia app; Saudi Arabia grant; Serbia UM; Serbia app; Serbia grant; Singapore app; Singapore grant; Slovakia UM; Slovakia app; Slovakia grant; Slovenia UM; Slovenia grant; South Africa app; Spain UM; Spain app; Spain grant; Sweden app; Sweden grant; Switzerland app; Switzerland grant; Taiwan UM; Taiwan appl; Taiwan grant; Thailand UM; Thailand app; Thailand grant; Tunisia app; Turkey UM; Turkey app; UK app; UK grant; USSR grant; Ukraine UM; Ukraine grant; United States app; United States grant; Uruguay app; Vietnam UM; Vietnam app; Vietnam grant; Other

Table of Contents

1. US9745123B2 Seed carrier with pivoting conveyor

Family 1/1

1 record(s) per family

Record 1/1 US9745123B2 Seed carrier with pivoting conveyor

Title: Seed carrier with pivoting conveyor

Title - DWPI: Agricultural seed or grain tender for moving e.g. grain, has conveyor hopper arranged below main hopper to receive agricultural product, and conveyor discharge placed above main hopper to dispense agricultural product into main hopper

Priority Number: US2007901321P | US200831867A | US13541553A

Priority Date: 2007-02-15 | 2008-02-15 | 2012-07-03

Application Number: US14606794A

Application Date: 2015-01-27

Publication Date: 2017-08-29

IPC Class Table:

IPC	Section	Class	Subclass	Class Group	Subgroup
B65F000100	B	B65	B65F	B65F0001	B65F000100
A01C001500	A	A01	A01C	A01C0015	A01C001500
B60P000136	B	B60	B60P	B60P0001	B60P000136
B65D008854	B	B65	B65D	B65D0088	B65D008854
B65G006532	B	B65	B65G	B65G0065	B65G006532
B65G006540	B	B65	B65G	B65G0065	B65G006540
B65G006542	B	B65	B65G	B65G0065	B65G006542
B60P000100	B	B60	B60P	B60P0001	B60P000100

IPC Class Table - DWPI:

IPC - DWPI	Section - DWPI	Class - DWPI	Subclass - DWPI	Class Group - DWPI	Subgroup - DWPI
A01C001500	A	A01	A01C	A01C0015	A01C001500
B60P000136	B	B60	B60P	B60P0001	B60P000136
B65D008854	B	B65	B65D	B65D0088	B65D008854
B65F000100	B	B65	B65F	B65F0001	B65F000100

B65G006532	B	B65	B65G	B65G0065	B65G006532
B65G006540	B	B65	B65G	B65G0065	B65G006540
B65G006542	B	B65	B65G	B65G0065	B65G006542
B60P000100	B	B60	B60P	B60P0001	B60P000100

Assignee/Applicant: UNVERFERTH MANUFACTURING COMPANY INC.,Kalida,OH,US

JP F Terms:

JP FI Codes:

Assignee - Original: UNVERFERTH MANUFACTURING COMPANY INC.

Any CPC Table:

Type	CPC - Current - Invention	CPC - Current - Additional	Version	Office
Current Current	**B65D 88/54** A01D 90/10	B60P 1/00	20130101 20130101	US US
Current Current	A01C 15/003 A01C 15/006	-	20130101 20130101	EP EP
Original Original Original Original Original Original Original	**B65D 88/54** A01C 15/003 A01C 15/006 B60P 1/36 B65G 65/32 B65G 65/40 B65G 65/42	B60P 1/00	20130101 20130101 20130101 20130101 20130101 20130101 20130101	US US US US US US US

ECLA:

Abstract:

A seed carrier includes a main hopper coupled with a frame via leg members. The main hopper has a discharge. A base plate is coupled with the frame. A support arm is rotatably coupled with the base plate at a first end. A belt driven conveyor having a conveyor hopper at a first end and a discharge at a second end is rotatably coupled with a second end of the support arm at an approximate center of gravity thereof. A latch mechanism is provided for detachably coupling the first end of the conveyor with the first end of the support arm such that the conveyor hopper is position below the main hopper discharge. When the conveyor is uncoupled from the first end of the support arm, the conveyor can rotate to a loading position wherein the discharge thereof can be positioned over the main hopper.

Language of Publication: EN

INPADOC Legal Status Table:

Gazette Date	Code	INPADOC Legal Status Impact
2021-02-18	MAFP	+
Description: MAINTENANCE FEE PAYMENT FEE PAYMENT YEAR 4 PAYMENT OF MAINTENANCE FEE, 4TH YEAR, LARGE ENTITY (ORIGINAL EVENT CODE: M1551); ENTITY STATUS OF PATENT OWNER: LARGE ENTITY		
2017-08-09	STCF	-
Description: INFORMATION ON STATUS: PATENT GRANT PATENTED CASE		
2015-04-06	AS	-
Description: ASSIGNMENT UNVERFERTH MANUFACTURING COMPANY, INC., OHIO ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:PETERSEN, BRIAN JAMES; SMITH, DAVID RICHARD; REEL/FRAME:035341/0879 2015-02-23		

Post-Issuance (US):

Reassignment (US) Table:

Assignee	Assignor	Date Signed	Reel/Frame	Date
UNVERFERTH MANUFACTURING COMPANY INC.,KALIDA,OH,US	PETERSEN, BRIAN JAMES	2015-02-23	035341/0879	2015-04-06
	SMITH, DAVID RICHARD	2015-02-23	-	-
Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).				
Corresponent: ROTHWELL, FIGG, ERNST & MANBECK, P.C. 607 14TH STREET, N.W. SUITE 800 WASHINGTON, DC 20005				

Maintenance Status (US):

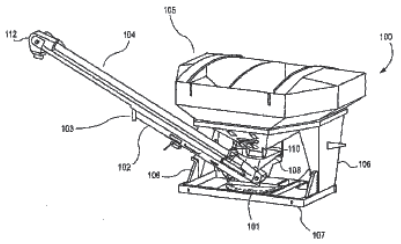
Litigation (US): 2019-01-23 2019 Unverferth Manufacturing Company, Inc. Meridian Manufacturing, Inc. N.D. Iowa 5:19cv04005 | 2018-03-12 2018 Unverferth Mfg. Co., Inc. Norwood Sales, Inc. North Dakota 3:18cv00053

Opposition (EP):

License (EP):

EPO Procedural Status:

Front Page Drawing:



Priority Number - DWPI: US2007901321P | US200831867A | US2012541553A | US14606794A
Priority Date - DWPI: 2007-02-15 | 2008-02-15 | 2012-07-03 | 2015-01-27
Assignee - Current US: UNVERFERTH MANUFACTURING COMPANY INC.

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United States Patent and Trademark Office
Office of the Commissioner for Patents

SEED CARRIER WITH PIVOTING CONVEYOR

PATENT #	APPLICATION #	FILING DATE	ISSUE DATE
9745123	14606794	01/27/2015	08/29/2017

Payment Window Status

WINDOW	STATUS	FEES
7.5 Year	Not Open	Not Due

No maintenance fees are due at this time. 7.5 year window opens on 08/29/2024.

Window	First Day to Pay	Surcharge Starts	Last Day to Pay	Status	Fees
3.5 Year	08/29/2020	03/02/2021	08/30/2021	Closed	Paid
7.5 Year	08/29/2024	03/01/2025	08/29/2025	Not Open	Not Due
11.5 Year	08/29/2028	03/01/2029	08/29/2029	Not Open	Not Due

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Entity Status UNDISCOUNTED

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