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October 02, 2015

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APPLICATION NUMBER: *12/925,405*
FILING DATE: *October 19, 2010*
PATENT NUMBER: *8166739*
ISSUE DATE: *May 01, 2012*

H&S Mfg. Co., Inc.
v. Oxbo Int'l Co.
IPR2016-00950
H&S Mfg Co., Inc.
Exhibit 1004-part 1

Certified by

Michelle K. Lee

Under Secretary of Commerce
for Intellectual Property
and Director of the United States
Patent and Trademark Office

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

DOCKET NUMBER	ANTICIPATED CLASSIFICATION OF THIS APPLICATION:		PRIOR APPLICATION	
	CLASS	SUBCLASS	EXAMINER	ART UNIT
12821.16USC2	056	192	A. M. TORRES	3671

CERTIFICATE UNDER 37 CFR 1.10:
"Express Mail" mailing label number: EM106017404US
Date of Deposit: October 19, 2010

I hereby certify that this paper or fee is being deposited with the U.S. Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450.

By: _____
Name: Tina Plante

CONTINUATION APPLICATION UNDER 37 C.F.R. § 1.53(b)

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

Dear Sir:

This is a request for filing a continuation application under 37 CFR § 1.53(b) of Serial No. 11/388,692, filed on March 24, 2006 entitled WINDROW MERGING APPARATUS by the following inventor(s):

Full Name Of Inventor	**Family Name** Dow	**First Given Name** Paul	**Second Given Name** W.
Residence & Citizenship	**City** Byron	**State or Foreign Country** New York	**Country of Citizenship** USA
Post Office Address	**Post Office Address** 7232 South Byron Road	**City** Byron	**State & Zip Code/Country** New York 14422/USA
Full Name Of Inventor	**Family Name** Dow	**First Given Name** Steven	**Second Given Name** S.
Residence & Citizenship	**City** Byron	**State or Foreign Country** New York	**Country of Citizenship** USA
Post Office Address	**Post Office Address** 6561 Transit Road	**City** Byron	**State & Zip Code/Country** New York 14422/USA
Full Name Of Inventor	**Family Name** Woodruff	**First Given Name** Mark	**Second Given Name** M.
Residence & Citizenship	**City** Bergen	**State or Foreign Country** New York	**Country of Citizenship** USA
Post Office Address	**Post Office Address** 7311 West Bergen Road	**City** Bergen	**State & Zip Code/Country** New York 14416/USA

1. ☒ Enclosed is the application; including the signed oath or declaration from the prior application, specification, claims and drawings. The continuing application is as follows: 17 pages of specification, 1 claims, 1 page of abstract, 24 sheets of drawings, and 4 pages of oath or declaration.

☒ The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

2. ☒ The filing fee is calculated below:

☒ Small entity status is claimed pursuant to 37 CFR 1.27.

3. ☒ Payment of fees:

☒ **PAYMENT OF THE FILING FEE IS BEING DEFERRED.**

4. ☒ The Commissioner is hereby authorized to charge any additional fees as set forth in 37 CFR §§ 1.16 to 1.18 which may be required by this paper or credit any overpayment to Account No. 13-2725.

5. ☐ A set of formal drawings (sheets) is enclosed.

6. ☐ Priority of application Serial No. , filed on in , is claimed under 35 U.S.C. 119.

☐ The certified copy has been filed in prior application Serial No. , filed .

7. ☒ The prior application is assigned of record to Oxbo International Corporation located at 7275 Batavia-Byron Road, Byron, New York 14422/USA.

8. ☒ The Power of Attorney in the prior application is to:

MERCHANT & GOULD P.C.
P.O. Box 2903 Minneapolis, MN 55402-0903

9. ☐ A preliminary amendment is enclosed. (Claims added by this amendment have been properly numbered consecutively beginning with the number next following the highest numbered original claim in the prior application.)

☐ Fee for excess claims is attached.

10. ☐ A petition and fee has been filed to extend the term in the prior application until . A copy of the petition for extension of time in the prior application is attached.

11. ☐ The inventor(s) in this application are less than those named in the prior application and it is requested that the following inventors identified above for the prior application be deleted:

12. ☐ A Non-publication Request under 37 CFR 1.213(a) is enclosed.

13. ☐ Information Disclosure Statement, Form 1449 and reference(s).

14. ☒ Authorization for Extension of Time All Replies.

15. ☒ Request for Recognition of Patent Practitioners as being of Record, under rule 37 C.F.R. § 1.32(c)(3)

16. ☒ Address all future communications to the **Attention of Karen A. Fitzsimmons** associated with the customer number below (may only be completed by attorney or agent of record)

17. ☒ A return postcard is enclosed.

23552
PATENT TRADEMARK OFFICE

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903 Minneapolis, MN 55402-0903
612.332.5300

Date: October 19, 2010

Karen A. Fitzsimmons
Reg. No. 50,470
KFitzsimmons/cjc

S/N UNKNOWN PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	DOW ET AL.	Examiner:	A. M. TORRESS
Serial No.:	UNKNOWN	Group Art Unit:	3671
Filed:	HEREWITH	Docket No.:	12821.16USC2
Title:	WINDROW MERGING APPARATUS		

CERTIFICATE UNDER 37 CFR 1.10:
"Express Mail" mailing label number: EM106017404US
Date of Deposit: October 19, 2010

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By: _____
Name: Tina Plante

AUTHORIZATION FOR EXTENSION OF TIME ALL REPLIES

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

Dear Sir:

Please consider this a petition for extension of time for a sufficient number of months to enter these papers or any future papers, if appropriate.

Please further charge any additional fees required to enter these papers or any future papers, or credit any overpayment of fees, to Deposit Account No. 13-2725.

Respectfully submitted,

23552
PATENT TRADEMARK OFFICE

MERCHANT & GOULD P.C.
P.O. Box 2903
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Date: October 19, 2010

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Karen A. Fitzsimmons
Reg. No. 50,470
KAF:cjc

S/N UNKNOWN PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	DOW ET AL.	Examiner:	A. M. TORRES
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By: _____
Name: Tina Plante

REQUEST FOR RECOGNITION OF PATENT PRACTITIONERS AS BEING OF RECORD, UNDER RULE 37 C.F.R. § 1.32(c)(3)

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

Because the Power of Attorney named more than ten patent practitioners, this paper is being submitted to indicate that the following patent practitioners are to be recognized by the Office as being of record:

Bruess, Steven C.	**Reg. No. 34,130**	**Kalinsky, Robert A.**	**Reg. No. 50,471**
Daley, Dennis R.	**Reg. No. 34,994**	**Schmaltz, David G.**	**Reg. No. 39,828**
Daulton, Julie R.	**Reg. No. 36,414**	**Sebald, Gregory A.**	**Reg. No. 33,280**
Fitzsimmons, Karen A.	**Reg. No. 50,470**	**Skoog, Mark T.**	**Reg. No. 40,178**

23552
PATENT TRADEMARK OFFICE

Respectfully submitted,
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Date: October 19, 2010

_____
Karen A. Fitzsimmons
Reg. No. 50,470
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M&G No. 12821.16-US-C2

WINDROW MERGING APPARATUS

Cross-reference to Related Applications

This application is a continuation of application Serial No. 11/388,692, filed March 24, 2006; which is a continuation of application Serial No. 10/405,030, filed March 31, 2003, now U.S. Patent 7,310,929; which applications are incorporated herein by reference.

Background of the Invention

Field of the Invention

The present invention relates to a windrow merger apparatus and a method of merging windrows. In particular, the present invention relates to a windrow merging apparatus and method having more than two heads and conveyor assemblies.

Description of the Prior Art

Devices for merging windrows are well known and are used to gather material, such as cut hay that might be windrowed, and merge it into a single windrow for harvesting or baling. Such windrow mergers have typically included a single pickup head and are either self propelled or pulled behind a tractor to move the material to a single row at one side of the merger. When used on a relatively small scale, these devices generally function in a satisfactory manner. However, for large scale operations requiring merging on large fields, the capacity of such mergers is limited because of their width and may not be sufficient to merge the material at an adequate rate for subsequent pickup by other devices. The merging must often be performed during a small timeframe when conditions are favorable. A limiting factor for the size of the merger device has been the towing capacity of tractors and other

propulsion devices. However as larger, more powerful tractors are utilized, larger equipment may be used. The larger tractors have led to larger harvesting machinery so that the need exists for a merger with greater merging rates so as not to slow the harvest process.

Although more power may be available to propel merger devices, other limitations are encountered that have restricted the size of windrow mergers. The machines must be transported from field to field and able to accomplish entry and exit in and out of fields, as well as meeting width limitations for transport on public highways and other roads without removing the heads.

In order to achieve a wider merger apparatus, folding mergers have been developed, such as shown in U.S. Patent No. 6,205,757 to *Dow et al.* The *Dow et al.* '757 patent has a two headed merger device that folds to a storage position for transport. In addition, the *Dow* device utilizes transverse conveyors to move materially laterally and provide various configurations for moving material to the desired windrow. The *Dow et al.* '757 patent teaches a device that is successful in providing higher capacity, greater width, and improved methods of merging while folding to a storage position for transport. However, further improvements to windrow mergers are possible.

Utilizing wider folding heads provides design challenges, especially achieving a linkage for folding wide heads and providing acceptable support, while limiting the loads and torque in operating positions, storage positions and during movement between the use position and the transport position. In order to achieve higher capacity, the heads may be widened, but the design becomes more complicated and difficult due to moving wider heads and staying within height and width limitations when folded. Controls and mechanisms for a folding more than two heads are not contemplated in the prior art.

Moreover, another problem that devices having multiple heads suffer from is that they typically form a gap between the ends of adjacent pickup heads so that some material may be missed in the field as the merger advances. Motors and other drive equipment have typically

been positioned at ends of heads, providing an obstruction between the ends of the heads, requiring a gap between the end row of tines adjacent the heads. Operating prior adjustable conveyors at a sufficient rate so that material is passed from one conveyor to the other has required spacing that allows for adjustment, which prohibits an unobstructed pickup face without gaps. Achieving a conveyor that does not require adjustable end rollers would improve the liability and eliminate constant adjustment for different configurations. If such manual adjustment is not required, control of the merger apparatus and changing between different operating configurations, or changing between storage and use positions could be accomplished remotely by an operator of the towing vehicle without having to manually adjust conveyor heads and other equipment. The utility of such a merger apparatus is increased if such changes and configurations may be made remotely during merging without having to stop.

It can be seen that a new and improved windrow merging apparatus is needed. Such a merger should provide for a wider effective pickup face that can accommodate various spacing of windrows and material and an unobstructed pickup face so that material is not missed in the field. Such a merger apparatus should provide for a merger having more than two heads and allow for folding of the heads between a use position and a storage position, providing for transport on public roads. A merger having conveyors with fixed heads that do not require adjustment increases the reliability and efficiency of such a merger. The present invention addresses these as well as other problems associated with windrow merging devices and merging operations.

Summary of the Invention

The present invention is directed to a windrow merger apparatus, such as is commonly used to merge cut hay and/or windrows into larger windrows for harvesting or baling. The windrow merger apparatus is configured for being towed by a tractor or other vehicle, or may be self-propelled. The merger includes a frame and three pickup and transfer

assemblies in a preferred embodiment. Each of the pickup and transfer assemblies includes a pickup head and an associated conveyor. The pickup heads have sets of tines that extend radially outward from the head spaced along the length of the head, transverse to the direction of travel. The tines rotate and pick the hay or other material up and send it rearward to an associated conveyor for moving to a single windrow. The heads include removable guards intermediate the sets of tines. Motors and related equipment are recessed so that the heads are closely aligned with the tines having an unobstructed face to the hay or other material as the merger travels. Star wheels having a ratcheted outer periphery configured for engaging material on the ground and rotating to aid in picking up the material may be disposed intermediate ends of adjacent pickup heads so that an unobstructed and continuous pickup face is achieved. In one embodiment, the pickup heads also include skid assemblies that support the heads and ride over the ground. The skid assemblies are positioned to the rear of the heads so as not to interrupt the continuity of the face of the tines as the merger apparatus travels.

In one embodiment, the pickup heads are placed under a preloaded torque to position the heads slightly lower than without the torque and are spring loaded as the pickup heads travel and engage the uneven terrain. In this manner, the heads more easily "float" over the uneven ground.

The merger has a linkage that is hydraulically driven in a preferred embodiment that folds the outer pickup and transfer assemblies rearward and inward. The center pickup and transfer assembly can be moved upward and downward in a pivoting type motion. When the pickup and transfer assemblies are raised, each outer assembly rests on supports in its raised and folded position. The folding systems are driven by hydraulic cylinders and provide for folding and unfolding even while the merger apparatus is moving and operating.

Each of the pickup and transfer assemblies includes a conveyor assembly associated with each pickup head. Shrouds extend in an arcing configuration at the rear of the conveyors over the top to direct material flung from the heads onto the conveyors. The conveyors are

driven by hydraulic motors in a preferred embodiment and are operable in either direction so that multiple merging configurations and operations are possible. The merging arrangement selected is varied by adjusting both the configuration of the pickup and transfer assemblies and the direction of the conveyors.

In a preferred embodiment, the conveyors include pulleys or rollers that are formed with blades radially disposed around a periphery of the pulley and engaging the conveyor belt. The pulleys do not have a through axle and the blades chop up material that falls off of the conveyor. Such a configuration also helps to avoid clogging, which may occur with material engaging through axles and other moving parts. Such pulleys also reduce the weight of the machine when compared to conventional pulleys.

Controls for the merger can be remotely actuated from the cab if the merger is self propelled, or from the cab of the tractor or other propulsion device. Since hydraulic motors drive the various systems on the merger, central hydraulic controls provide for simple, reliable remote actuation that can be accomplished from the cab of a towing vehicle while the merger operates and continues to travel. The tractor and the merger may simultaneously be operated from a single location by one person with such a control arrangement.

These features of novelty and various other advantages that characterize the invention are pointed out with particularity in the claims annexed hereto and forming a part hereof. However, for a better understanding of the invention, its advantages, and the objects obtained by its use, reference should be made to the drawings which form a further part hereof, and to the accompanying descriptive matter, in which there is illustrated and described a preferred embodiment of the present invention.

Brief Description of the Drawings

Referring to the drawings wherein like reference numerals and letters indicate corresponding elements throughout the several views:

Figure 1 is a perspective view of a merger apparatus according to the principles of the present invention in a use position with conveyor shrouds removed for clarity;

Figure 2 is a top plan view of the merger shown in Figure 1 in the use position;

Figure 3 is a side elevational view of the merger shown in Figure 1 in the use position;

Figure 4 is a front perspective view of the merger shown in Figure 1 in the use position;

Figure 5 is a perspective view of the merger shown in Figure 1 with two heads at a folded position;

Figure 6 is a top plan view of the merger shown in Figure 5 with the two outer heads at the folded position;

Figure 7 is a side elevational view of the merger shown in Figure 5 with the two outer heads at the folded position and the center head raised;

Figure 8 is a front perspective view of the merger shown in Figure 1 with one head at a folded position;

Figure 9 is a rear perspective view of the merger shown in Figure 8 with one head at a folded position;

Figure 10 is a side elevational view of a star wheel device for the merger apparatus shown in Figure 1;

Figure 11 shows an end sectional view of a hexagonal shaft construction utilized in the conveyor of the merger apparatus;

Figure 12 shows a schematic view of the control system for the merger apparatus shown in Figure 1;

Figure 13 is an elevational of a pretorque device showing a head angled from the pretorque and at a non-torqued position in phantom;

Figure 14 is a bottom perspective view of the merger shown in Figure 1;

Figure 15 is a perspective view of a head assembly according to the principles of the present invention;

Figure 16 is a bottom perspective view of a conveyor;

Figure 17 is an end sectional view of a pickup and transport assembly;

Figure 18 is an end elevational view of the pre-torque device for the head of the merger;

Figure 19 is a partially exploded perspective view of a pickup and transport assembly for the merger apparatus;

Figure 20 is a perspective partially exploded view of a conveyor for the merger apparatus;

Figure 21 is a perspective view of a conveyor roller; and

Figures 22-24 are diagrammatic views of patterns of merger methods according to the principles of the present invention.

Detailed Description

Referring now to the drawings, and in particular to Figure 1, there is shown a merger apparatus, generally designated **100**. A towing device, generally a tractor **1000** tows the merger apparatus **100**. In other configurations, the merger apparatus **100** may be self propelled, such as is well known to those skilled in the art and the principles of the present invention apply to towed and self-propelled devices.

As shown generally in Figures 1-4, the merger includes three pickup and transfer assemblies, designated **104, 106** and **108**. The assemblies **104, 106** and **108** are supported on a framework **101** including folding arms **102** that provides for movement of the outer assemblies **104** and **108** between a use position and a folded position, as explained hereinafter. The merger apparatus **100** includes steerable rear wheels **114** and a hitch **110** for mounting to the tractor **1000**. A steering linkage **116**, such as is well known in the art, connects the towing vehicle **1000** to the rear wheels **114** to improve tracking so that the merger apparatus **100** substantially follows directly behind the towing vehicle **1000**. A power take off typically provides the power to the merger apparatus **100** from the towing vehicle **1000**. In addition, the controls are mounted in the cab of the towing vehicle **1000**, as explained hereinafter, so that an operator may control all merger functions without having to stop the merging operation and make manual adjustments to the merger **100**.

The folding arm **102** is actuated by a linkage **118** to facilitate movement of the pivoting assemblies **104, 106** and **108** between a use position to a storage position. Each pickup and transfer assembly **104, 106** and **108** includes a head unit, designated **124, 126** and **128** respectively. The heads **124, 126** and **128** pick up and deliver the crop rearward to corresponding conveyors **134, 136** and **138**. As shown in Figures 4, 15 and 16, each pickup and transfer assembly **104, 106** and **108** includes an arcing shroud **160**. The shrouds **160** intercept material that has been thrown rearward and directs it downward onto the corresponding conveyor. The shrouds **160** are shown removed for clarity in several of the views, but is foreseen that the shrouds **160** will be utilized in most merging operations.

The merger **100** has flexibility with respect to conveyor travel direction as well as with respect to the number of heads operating, so that multiple configurations for different merging needs and operation are possible. As shown in Figures 1-4, the merger **100** may be operated with all three pickup and transfer assemblies, **104, 106** and **108** in a lowered operating position. When operated in this mode, the merger **100** can cover a much wider swath, merging more material and a greater number of windrows than is possible with prior merger devices.

As shown in Figures 8 and 9, either of the outer pickup assemblies, namely pickup assembly **104** or pickup assembly **108,** may be raised independently of each of the other assemblies. With such a configuration, the merger **100** is able to operate with two of the pickup and transfer assemblies, therefore merging a swath two thirds of the full width of the merger **100**, such as when configured as shown in Figures 1-4. Such a two head merging configuration may be needed for irregularities in the terrain, to access smaller fields or irregular shaped fields, or for improved merging at edges of fields.

As also shown in Figures 8 and 9, either the assembly **104** or the assembly **108** may be raised independently of the other assemblies. This provides for merging while having either of the pickup and transfer assemblies **104** or **108** extending to one side or the other of the towing vehicle **1000**. In addition, the conveyors **134, 136** and **138** are reversible, to be operable in both directions so that material may be selectively transported either to the left or the right. The conveyors **134, 136** and **138** may also operate in either direction when one of the pickup and transport assemblies is raised. With such flexibility, it is possible to direct material to the outer ends of the pickup and transport assemblies **104** or **108** or to either of the ends of transport assembly **106**, depending on the configuration of the merger **100** and the needs of the merging apparatus.

Referring now to Figures 5-7, the merger **100** may have both pickup assemblies **104** and **108** raised simultaneously while the center pickup and transfer assembly **106** remains lowered in an operating position. The pickup assemblies **104** and **108** generally rest on supports **122** while raised and folded. The pickup assembly **106** may be operated as a single conveyor merger with its head **126** collecting material and throwing it backward to the associated conveyor **136** for transport to either end of the pickup assembly **106**. With this configuration, even smaller areas may be accessed with a merger capable of collecting material from much greater area per pass than is possible with prior art merger devices. In addition, as shown in Figure 7, all of the pickup and transfer assemblies **104, 106** and **108** may be raised for transporting the merger when not operating to collect material. In this configuration, with all three pickup and transfer assemblies **104, 106,** and **108** are raised, the

merger **100** is capable of transport on public roads. The pickup and transfer assemblies **104** and **108** fold rearward and inward to minimize the overall width and height of the merger **100**. The merger **100** has the additional advantage of being centered behind the transport vehicle in its transport configuration. As the conveyors and folding linkages are independently operable, the merger **100** may be operated continuously, even while the pickup and transfer assemblies **104, 106** and **108** are being raised or lowered. This control provides for continuous operation and improved efficiency that is not possible with prior merger devices that require that the merger be stopped to raise, lower or otherwise adjust any of the merger's equipment.

The pickup and transport assemblies **104** and **108** mount to the folding arm **102** on mounts **192** attached to a pickup and transport assembly support frame **190** associated with each assembly **104** or **108**. Each of the pickup and transfer assemblies **104, 106** and **108** is interchangeable with the other pickup and transfer assemblies and vary only in their mounting to the merger **100**. This interchangeability reduces the parts inventory necessary for servicing the merger device **100** and decreases down time when repair of one of the pickup assemblies is required.

Merger Heads

Referring now to Figures 14, 15 and 17, the merger heads **124, 126** and **128** include a multiplicity of tines **200** spaced along the length of each head. In addition, as shown most clearly in Figure 17, the tines **200** are also spaced radially around the circumference of an arbor **168** along the length of the head. The tines **200** are somewhat flexible and are pivotally mounted to provide flexure should a tine engage the ground or other obstacle. Intermediate the sets of tines **200** are guards **202** that extend around the top front and bottom of the arbor **168** and provide protection to the inner equipment of the heads. The guards **202** are straight members in a preferred embodiment that are bent and mounted under tension, as explained in co-pending U.S. Patent Application Serial No. 10/027,930, incorporated herein by reference. The tines **200** and guards **202** are easily removable and replaced should damage occur. The

guards **202** may be loosened at one end while remaining attached at a second end to provide easy access to damaged tines **200** and perform other maintenance. The heads include a housing **204** that is mounted to the corresponding pickup and transfer assembly on the preloaded torque assemblies **210** as shown in Figure 19. The preloaded torque assemblies **210** provide a lifting force against the weight of the heads **124, 126** and **128** to improve the ride as the merger **100** travels over irregularities in the terrain. As shown most clearly in Figure 17, the heads **124, 126** and **128** are mounted with approximately 15 degrees of bias from the preloaded torque assembly in variance to a non-torqued position, shown in phantom in Figure 13. The heads are therefore spring loaded and rise up and over rocks and other irregularities with greater ease. In addition to improving the ability to "ride" over irregularities, the preloading force improves performance by increasing contact time with material to be picked up. The flexure also decreases the damage and therefore, maintenance and down time for the merger.

Referring now to Figure 18, the preloaded torque assembly **210** includes a center rectangular floating element **212** that is supported by four resilient members **214** spaced on the four sides of the center floating element **212**. A housing **216** retains the center member **212** and the resilient support members **214** and allows for mounting of the heads to the preloaded torque assembly **210**.

As shown most clearly in Figure 15, a hydraulic motor **206** drives each arbor **168** for the heads **124, 126** and **128.** The hydraulic motor **206** is recessed into the housing **204** of the heads **124, 126** and **128**. With the hydraulic motor **206** recessed, the ends of the heads **124, 126** and **128** are positioned substantially to abut one another. No obstruction due to drive mechanisms, support wheels or other mechanisms inserted intermediate the adjacent heads is required, as was typical with previous merger devices. Therefore, the end tines **202** of one head are close to the tines **202** of another head so that there are no large gaps between the heads as occur with previous merger devices, which had motors and other equipment between heads. In addition, the merger includes star wheels **162** mounted intermediate ends of the heads **124** and **126** and intermediate ends of the heads **126** and **128**. The star wheels **162** are

rotatably mounted to the housing **204** at the ends of the heads, as shown most clearly in Figure 19. As shown in Figure 10, the star wheels **162** include a number of teeth spaced around the periphery of the star wheel **162** in a notched configuration. As the star wheels **162** rotate, the notches and teeth intercept material that is not picked by the end tines **202** of the adjacent heads and aids in directing the material rearward. The star wheels **162** eliminate gaps and minimize the material that is not picked up and left on the ground after the merger **100** passes.

The heads **124, 126** and **128** of the present invention provide an unobstructed pickup face to engage the material to be windrowed as the merger **100** moves. Recessed hydraulic motors **206** allow for placing the ends of the heads **124, 126** and **128** in close proximity to one another and eliminate the large gaps where prior art drive support mergers and other mechanisms and machinery were located. Moreover, the star wheels **162** inserted intermediate the ends of heads **124, 126** and intermediate the ends of the heads **126** and **128**, as shown most clearly in Figure 4, ensure that the face of the merger is unobstructed and continuous. The merger **100** provides improved pickup while achieving a greater width per pass than has been seen heretofore.

Folding

A folding linkage **118** that is hydraulically driven accomplishes the folding of the pickup and transfer assemblies **104, 106** and **108**. The outer pickup and transfer assemblies **104** and **108** are folded rearward and inward from the use position shown in Figure 1, to the storage position shown in Figure 5. The pickup and transport assemblies **104** and **108** are directed up, in and to the rear at the folded position shown in Figure 5. The arms **102** of the folding frame **101** engage and rest on supports **122** at their folded position. Folding of each of the assemblies **104, 106** and **108** can occur independently from folding of the other assemblies and can occur while the merger **100** is in operation and moving. The pickup and transfer assemblies **104, 106** and **108** are substantially compact and are interchangeable so that a spare head may be utilized and mounted to either of the folding linkages **118** or mounted as the

center head **106**.

Material Transport System

Each of the pickup and transport assemblies **104, 106** and **108** includes an associated conveyor assembly, **134, 136** and **138** respectively, such as shown in Figures 1, 4, 5 and 14. Although not shown in several of the views, the conveyor assemblies include shrouds **160** as shown in Figure 15. The shrouds **160** are generally positioned behind the rear edge of the conveyor and extend upward and forward in an arcing configuration over the conveyors to direct material thrown rearward by the heads down onto the moving conveyor. This configuration ensures that a greater percentage of the material is actually transferred and merged.

Referring to Figures 16, 19 and 20, each of the conveyors **134, 136** and **138** includes a belt **170** mounted above end pulleys (also commonly called rollers) **172**. The upper length of the belt **170** travels on horizontal supports **240** extending along the length of the belt. A tensioner pulley **174** is positioned below and intermediate the end pulleys and mounts in a slot **178** in a tensioner plate **176**. The slot **178** extends vertically so that the weight of the tensioner pulley **174** aids in providing proper tension to the conveyor belt **170**.

Each of the pulleys **172** and **174** is uniquely configured to eliminate a center axle and its associated problems. The pulleys **172** and **174** are similar with the only differences occurring in the manner they are mounted and driven. The rollers **172** and **174** include a plurality of blades **180** spaced about a periphery of bulkheads **182** and center V-rings **184**. In the embodiment shown, twelve of such blades **180** are utilized, but other configurations with fewer or more blades could also be utilized. The bulkheads **182** include radially extending slots, as shown in Figure 21 to position and hold the blades **180**. The V-rings also provide for engaging a tracking member from the belt **170** in some configurations to ensure that the belt does not drift laterally and remains properly aligned. The blades **180** preferably include a shallow arcing profile so that a slight crown is provided to the belt **170**. With the multiple blades **180** and with elimination of a center axle, material that otherwise may fall into the

roller area may be chopped up by the blades **180**. In addition, material is less likely to stick, jam or bind axles, as is a common problem with conveyor pulleys. The pulleys **172** and **174** include a bearing housing **188** at one or both ends. In addition, at least one of the rollers includes a drive socket for receiving a drive shaft from a hydraulic conveyor motor **230** as shown in Figure 20. The bearing housings **188** receive bearings **232** that connect over mounts **234**. As shown in Figure 11, the merger **100** utilizes hex pins **236** throughout its construction that engage an inner hex shaped surface of the bearings **232** and provides for simpler assembly and maintenance, due to improved tool access and engagement. Tension on the belt **170** is applied by connecting the ends at a seam **220** and tightening. The seam **220** defines a flange, as the belt **170** typically includes a plurality of flanges extending transverse to the length of the belt to aid in moving material. The seam **220** includes a hinge **222** that receives a pin and is folded over for tightening. The ends of the belt **170** are then bolted together or otherwise connected to provide proper tension on the belt.

With the present configuration of the conveyors, the ends are fixed rather than sliding. This keeps the pulleys **172** at a fixed mounting location and provides advantages in alignment and reconfiguration. With fixed ends, no adjustment is made as the pickup and transport assemblies **104**, **106** and **108** are folded or unfolded. Since there is no spacing needed for adjustment, overall width is decreased and ends of the conveyors are maintained in a closer proximity. Moreover, it has been found that with the motors for the heads recessed, the ends of the conveyors **134**, **136** and **138** are sufficiently close so that at operating speed, material does not fall between the ends of the belts and is propelled forward with sufficient momentum to reach the belt **170** of the next adjacent conveyor.

The tension is also critical as the hydraulic conveyor motors **230** are reversible so that the conveyors **134, 136** and **138** may be operated to direct material for merging to either end of the merger **100**. In addition, the conveyors **134, 136** and **138** are operable independent of one another to provide greater flexibility with merging material than is possible with the prior art. Tensioning becomes more critical as the belt **170** is pulled when the belt travels in a first direction, but is pushed when the belt **170** travels in a second direction. If the belt **170** is not

in a proper tension and does not have proper tracking devices, the conveyors may jam or otherwise malfunction. The present invention provides sufficient tracking, drive and alignment that such problems are overcome.

Controls

Referring now to Figure 12 there is shown the controls **300** for the merger **100**. The controls **300** are remotely actuated from the cab of the tractor **1000** in a preferred embodiment, but may also be utilized in the cab of self propelled embodiments. The control panel **300** includes switches to control the function of the merger **100**. Three position toggles switches **304, 306** and **308** control the conveyor belt direction for the pickup and transfer assemblies **104, 106** and **108**, respectively. The switch **304** controls the left conveyor and pickup and transfer assembly **104**. The switch **304** controls the center conveyor **134** and the head **124**. The switch **306** controls the center conveyor **136** and the head **126**. The switch **308** controls the center conveyor **138** and the head **128**. In one position, the conveyors travel to the left and in another position, the conveyors travel to the right. With the switches **304, 306** or **308** in the middle position, the associated conveyor and pick up head are turned off.

The control panel also includes switches **314, 316** and **318** to control raising and lowering of the pickup and transfer assemblies **104, 106** and **108**, respectively. In a preferred embodiment, the switches **314, 316** and **318** are rocker type switches. The switches **314, 316** and **318** allow for clearing obstructions and positioning the pickup and transfer assemblies **104, 106** and **108** for road travel. A switch **320** allows for height adjustment of the heads **124, 126** and **128**. The controls **300** are easily accessible by an operator and provide for adjustment while moving. The controls **300** include wiring leading to electro-hydraulic valves on the merger **100** in a preferred embodiment. Hydraulic pressure is provided by the hydraulic system of the tractor **1000** for lifting functions. The heads **124, 126** and **128** and the conveyors **134, 136** and **138** are powered by a tractor power take off driven hydraulic pump. The hydraulic system also provides for a floating operation for the heads **124, 126** and **128** when the associated conveyor is running in the normal operating condition.

Supports

Referring now to Figures 16 and 19, skid assemblies **140** provide support and height adjustment for the pickup and transport assemblies **104, 106** and **108**. The skid assemblies **140** include a rear wheel **142** and one or more front rollers **148** mounted on a skid body **144**. A ski type member **146** may extend forward with a lower ramped lead surface to provide for more easily traveling over uneven terrain. The skid assemblies **140** include adjustment holes **154** and **152** for adjusting the position of the rollers **148** as well as their mounting position on the pickup and transfer assemblies **104, 106** and **108**. A linkage **218** is utilized for adjusting the position of the skid assembly **140** and therefore the height of the associated support head. The skid assemblies **140** are positioned below the conveyors **134, 136** and **138** to the rear of the heads **124, 126** and **128**, as also shown in Figure 17. The positioning of the skid assemblies **140** eliminates impinging on the operation of the heads and provides for achieving an unobstructed face for the pickup heads **124, 126** and **128**.

Merging Operations

Referring to Figures 22-24, the merger apparatus **100** may be configured for varying the merging patterns. As shown in Figure 23, the conveyors can be operated with two conveyors driven in a first direction and a third conveyor driven in the opposite direction. Figure 23 shows the merger **100** configured for a typical merging operation with all conveyors operating in the same direction. It can be appreciated that the merger **100** may also be operated with only two heads or one head. Such merging patterns are shown in U.S. Patent 6,205,757 to Dow.

As shown in Figure 24, the merger may create a double windrow B by transferring a single windrow onto another single windrow A. This is accomplished with a single pickup and transfer assembly operating in a first direction. Triple windrows C are created with two pickup and transfer assemblies operating in the same direction to merge two windrows onto a single windrow A. As shown in Figure 22, quadruple windrows D are created when three windrows are transferred onto a single windrow A.

As shown in Figure 23, the merger **100** may be operated with all three pickup and transfer assemblies operating in the same direction. With such a configuration, three windrows may be merged from each side of a single windrow A. Six windrows may be merged to create a septuple windrow G as the merger **100** is advanced up and down the windrows.

It can be appreciated that the merger **100** of the present invention provides for changing the number of pickup and transfer assemblies operating and the direction of the conveyors to combine windrows into larger merged windrows. Any combination of from one to seven windrows may be achieved by the merger **100** to meet the capabilities of the harvesting equipment and account for the field and weather conditions.

These features of novelty and various other advantages that characterize the invention are pointed out with particularity in the claims annexed hereto and forming a part hereof. However, for a better understanding of the invention, its advantages, and the objects obtained by its use, reference should be made to the drawings which form a further part hereof, and to the accompanying descriptive matter, in which there is illustrated and described a preferred embodiment of the invention.

WE CLAIM:

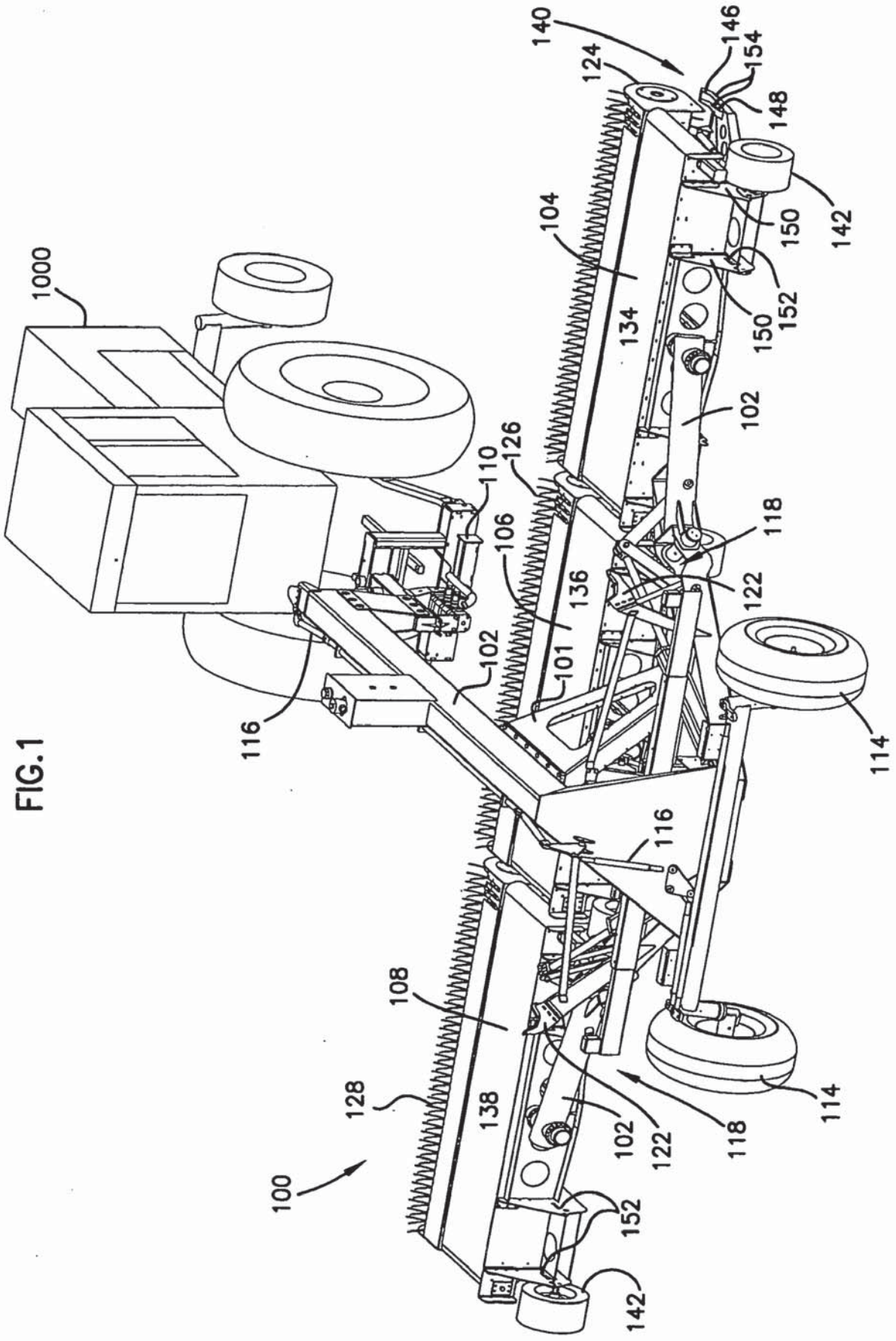
1. A windrow merger, comprising:

a merger assembly including a center pick up head, a left pick up head, and a right pick up head, each of the center, left, and right pick up heads having a length, the left and right pick up heads each being positionable in an extended use position and a retracted travel position;

wherein the lengths of the left and right pick up heads are generally transverse to a direction of travel when positioned in the extended use position, and wherein the lengths of the left and right pick up heads are generally aligned with the direction of travel when position in the retracted travel position, the left and right pick up heads further being located above the center pick up head when positioned in the retracted travel position.

Abstract

A windrow merger has a frame supporting first, second and third pickup assemblies, with the two outside pickup assemblies foldable between an extended use position and a retracted travel position. Each of the pickup assemblies includes a reversible conveyor providing multiple windrow merging configurations. The pickup assemblies are interchangeable and aligned to define an unobstructed pickup face.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142

FIG. 1

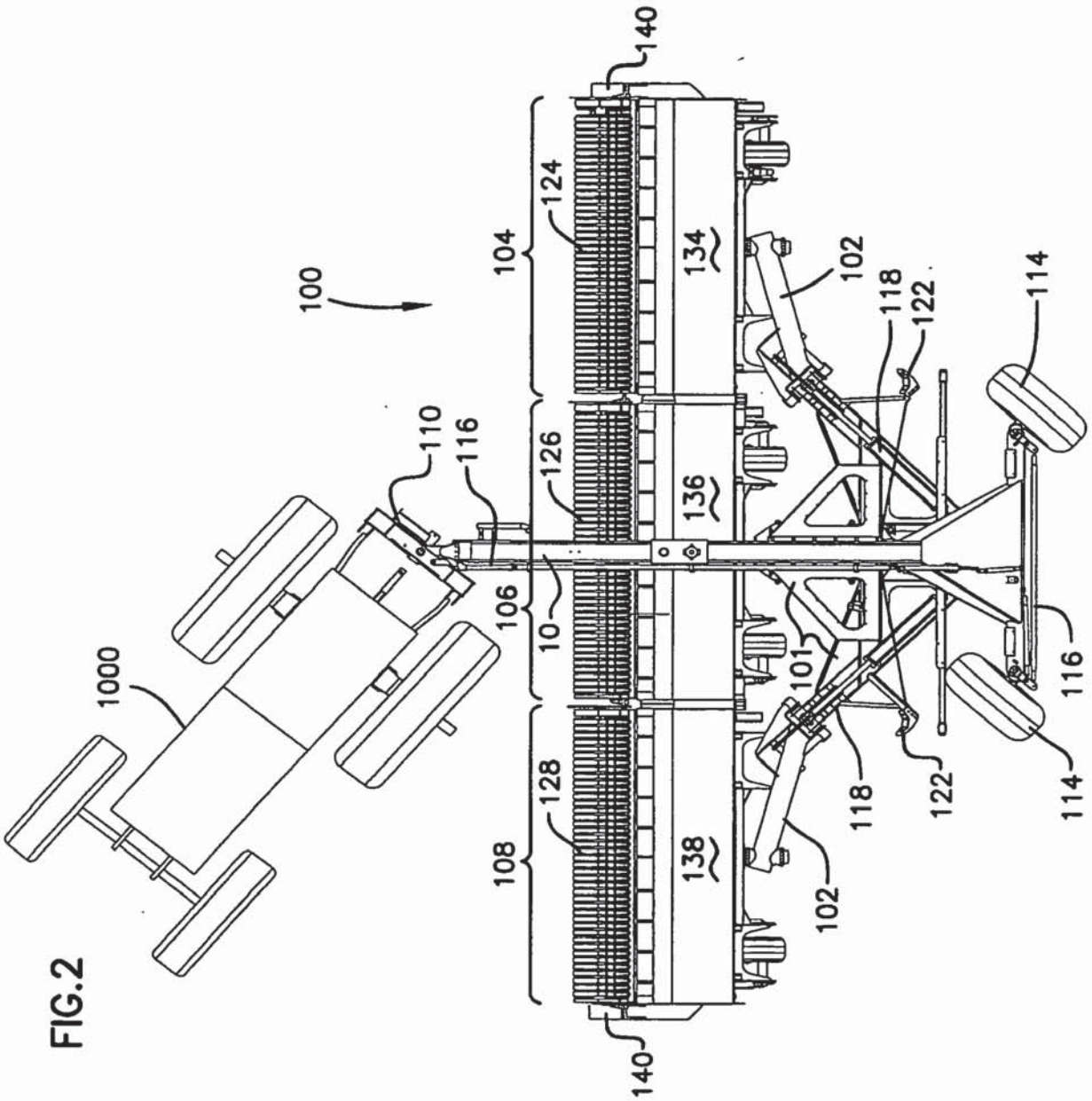
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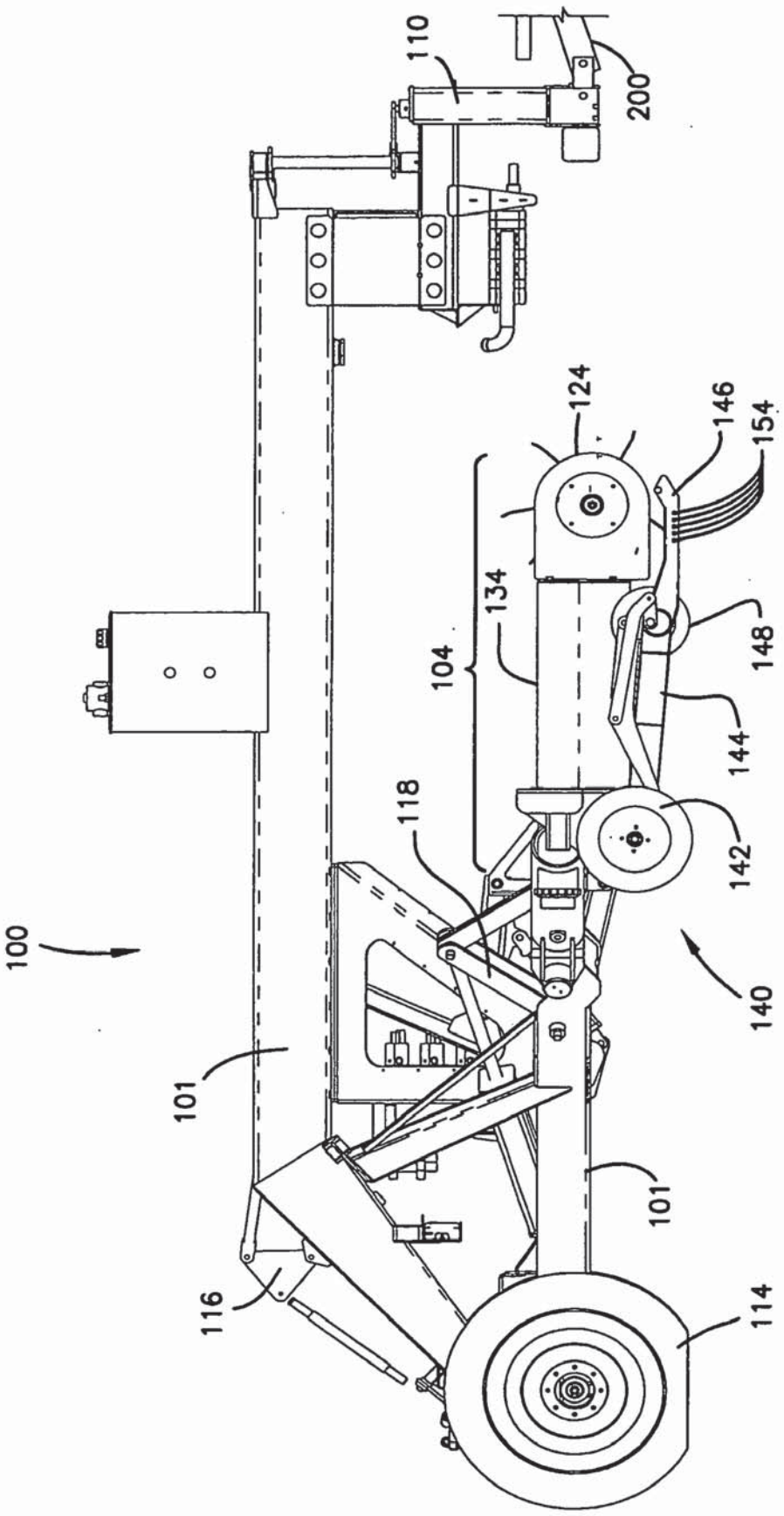
FIG.2

FIG.3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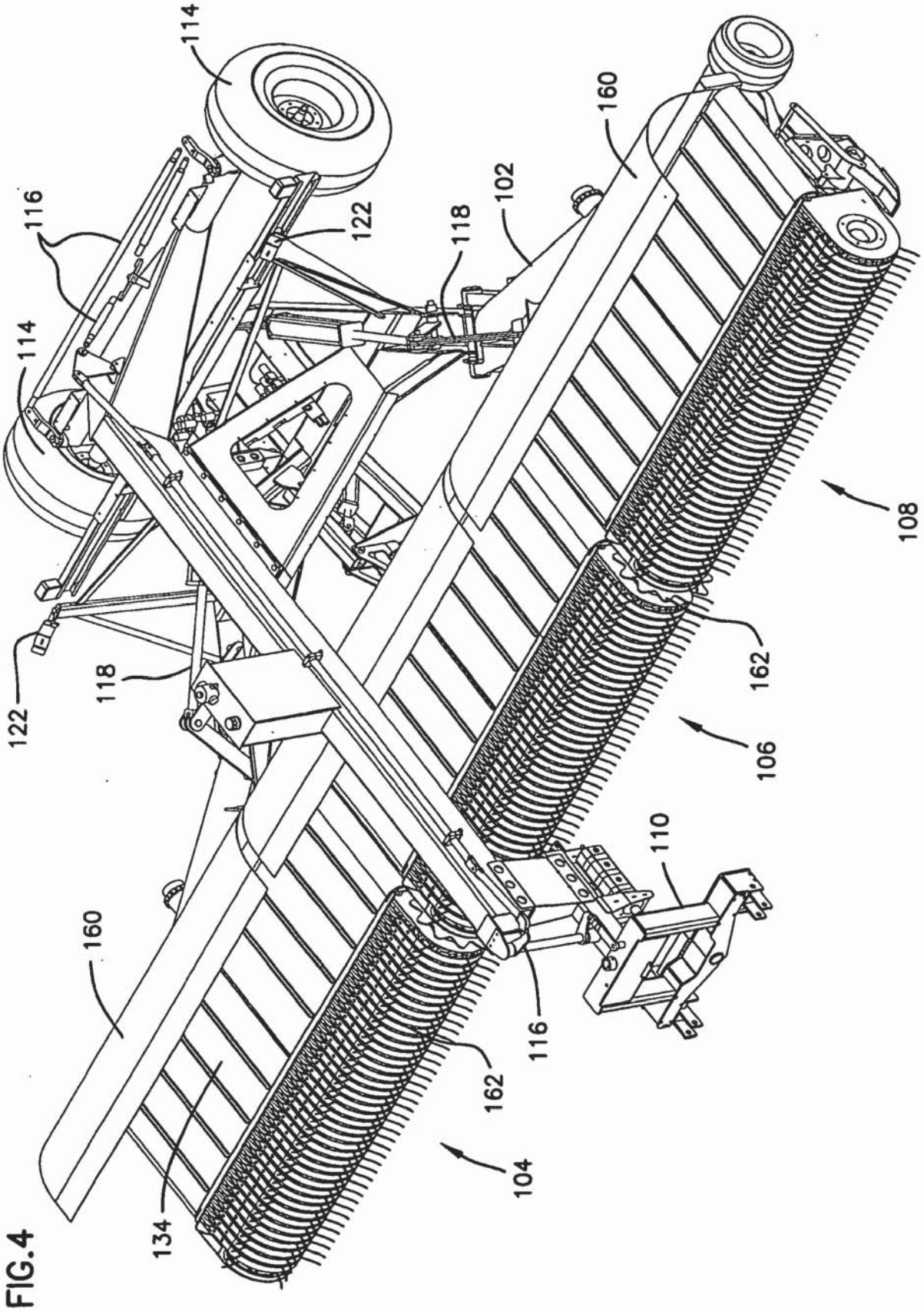
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134
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FIG.4

FIG.5

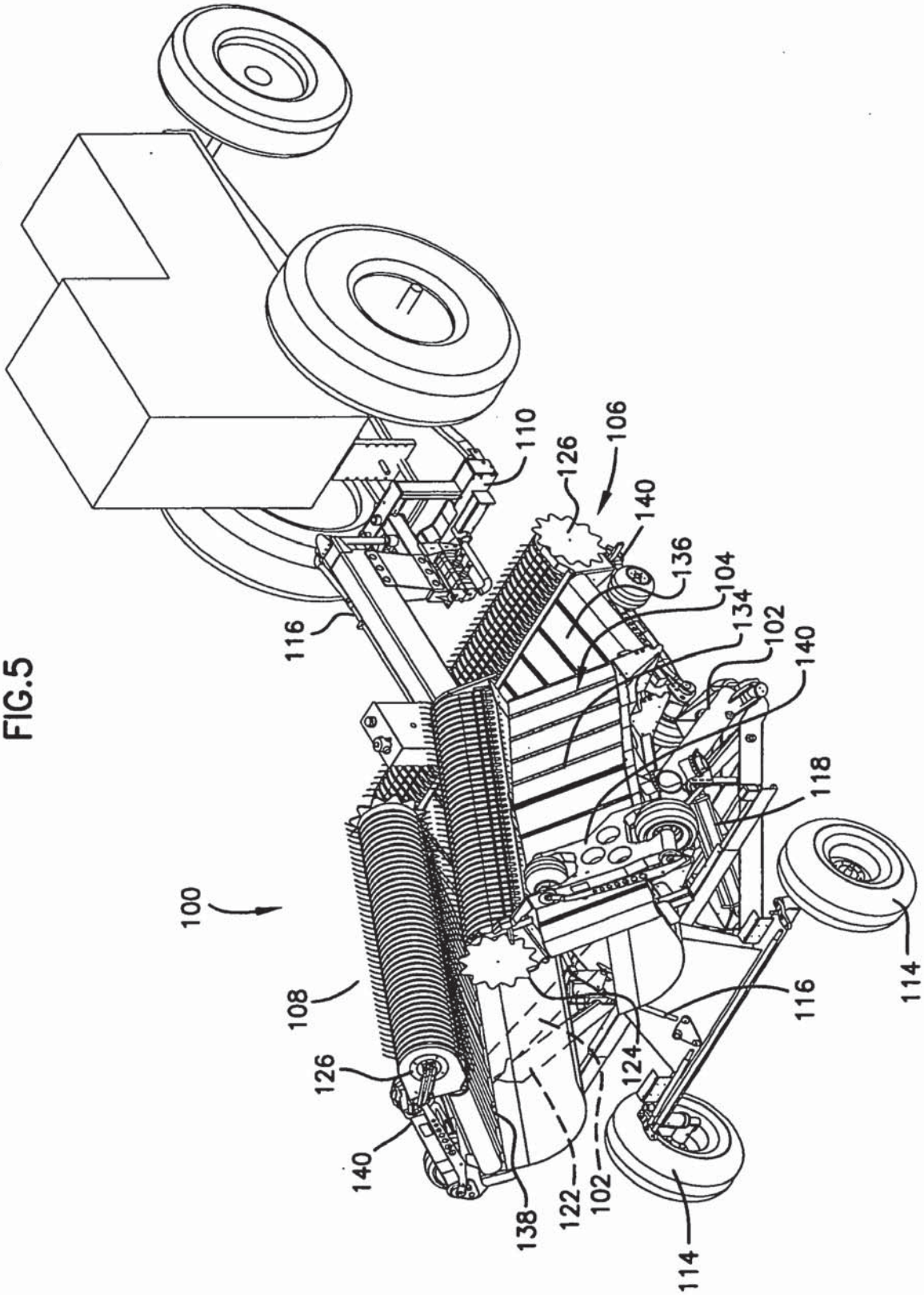

FIG.6

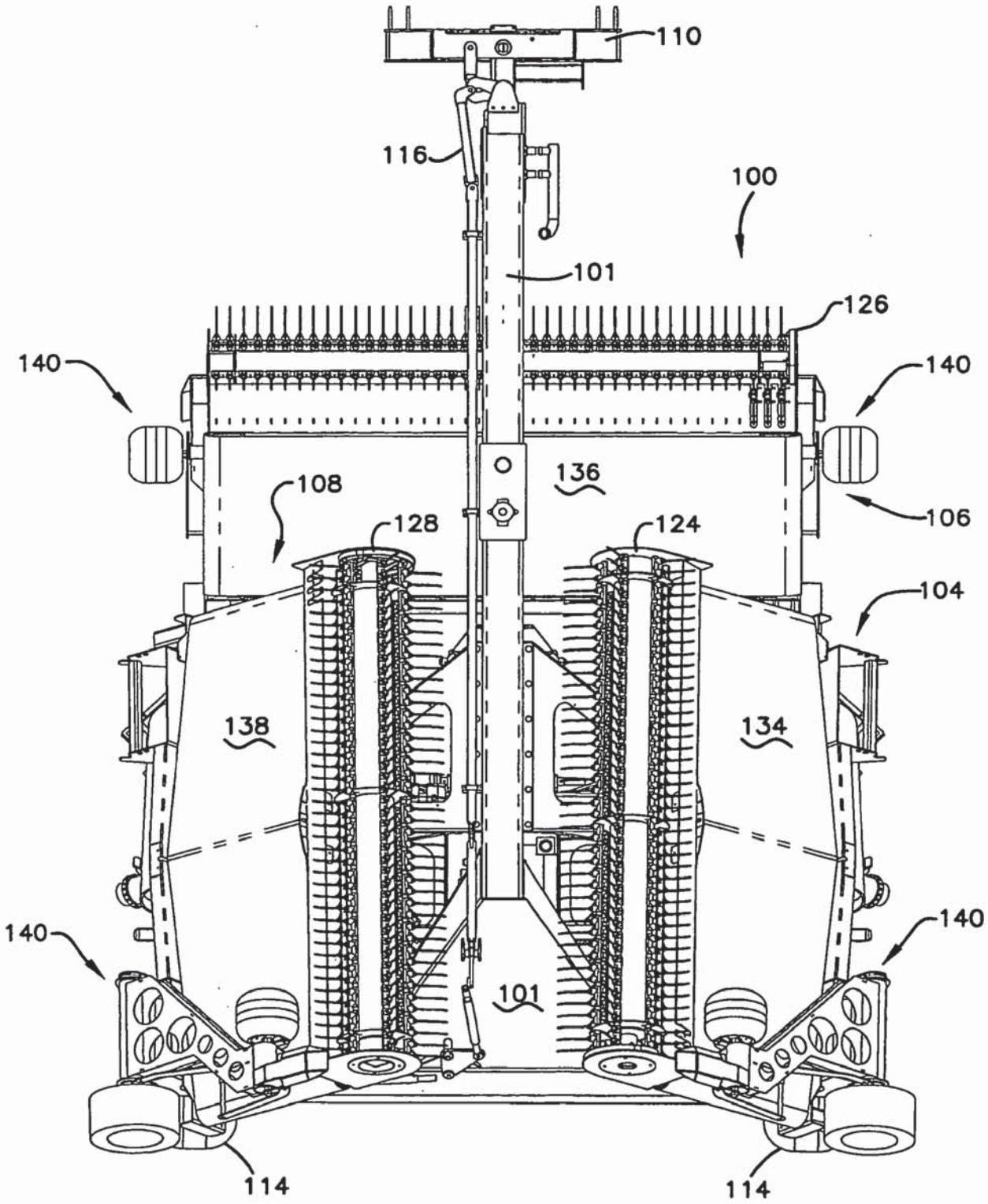
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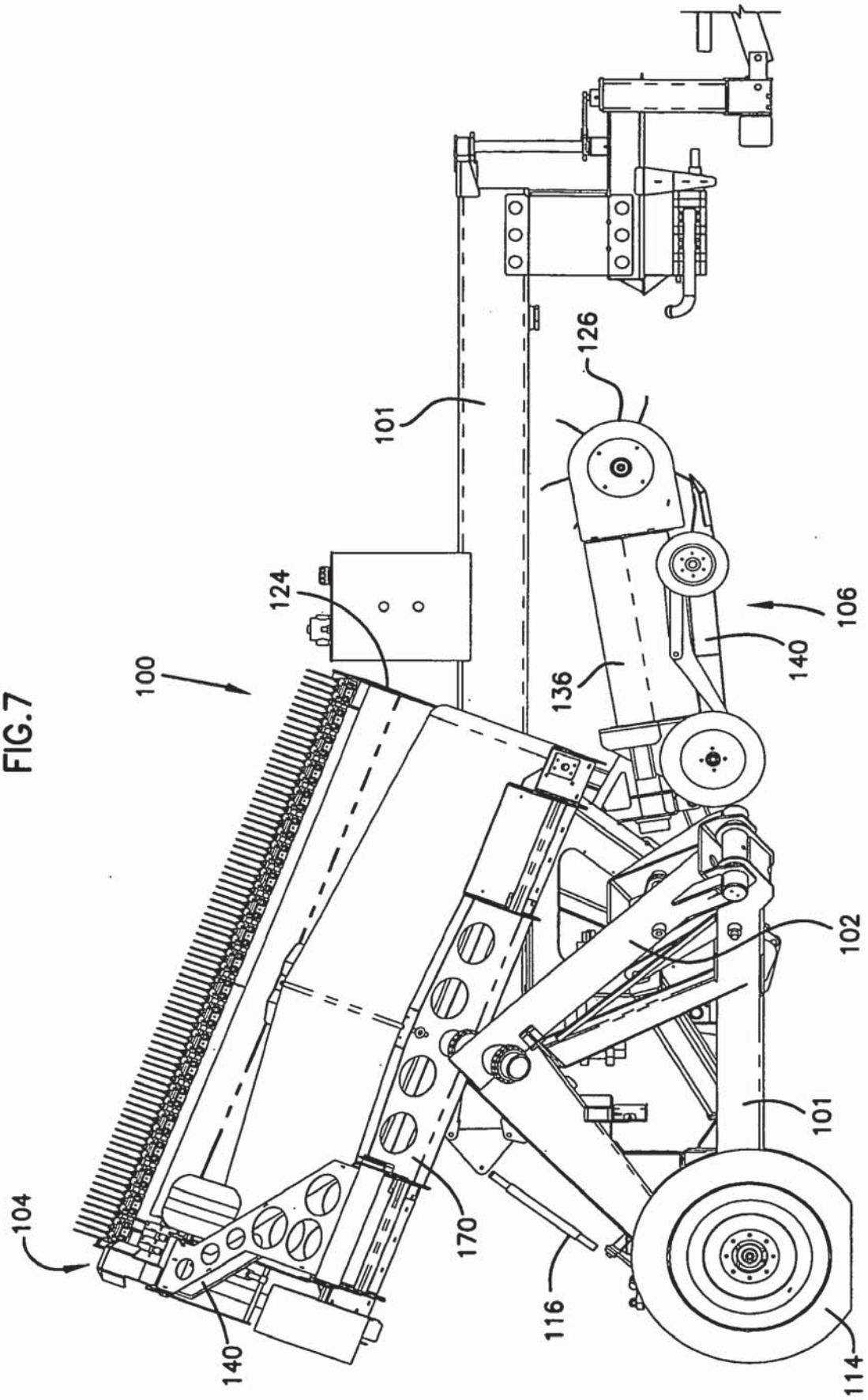
FIG.7



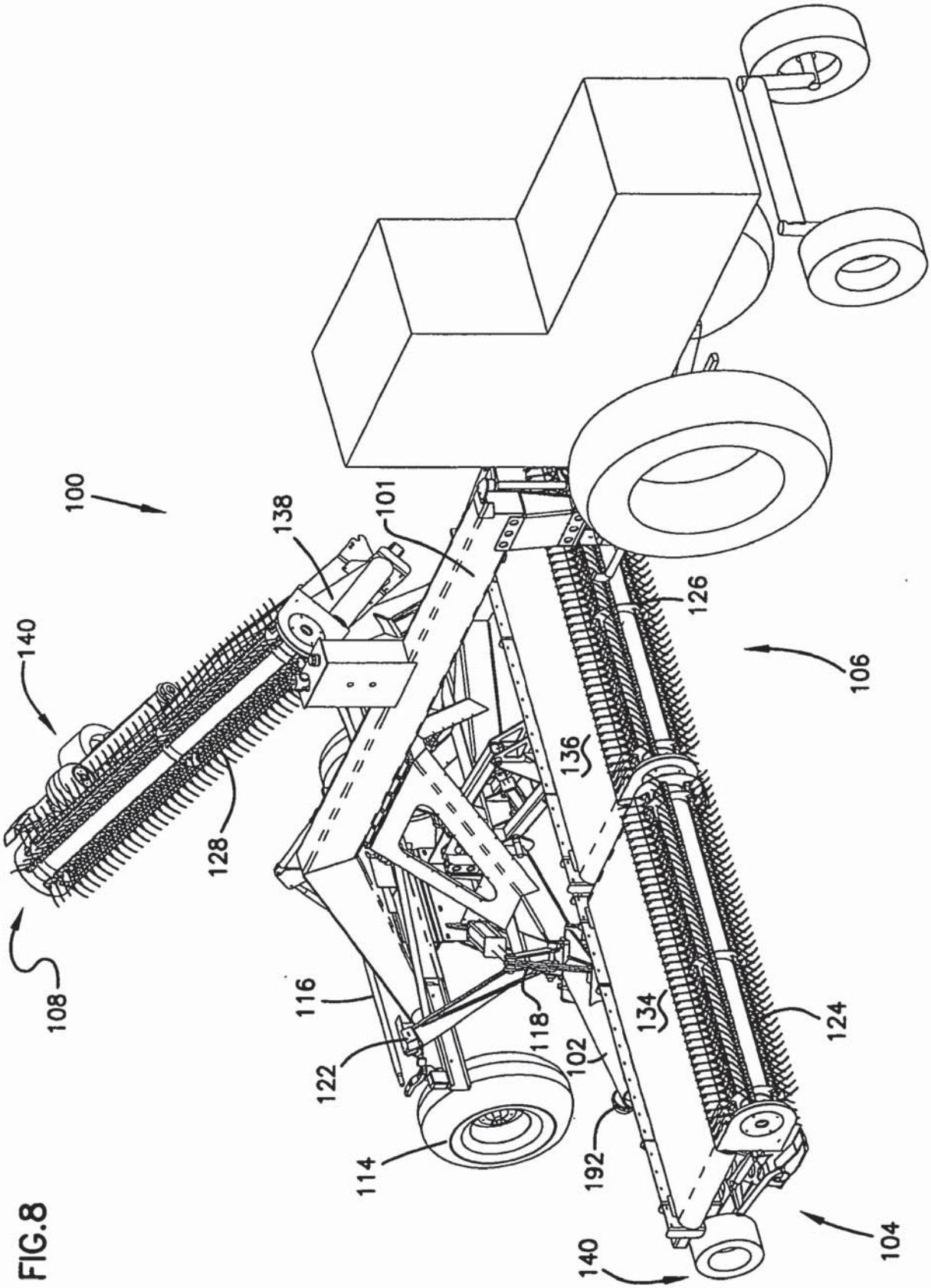

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FIG.8

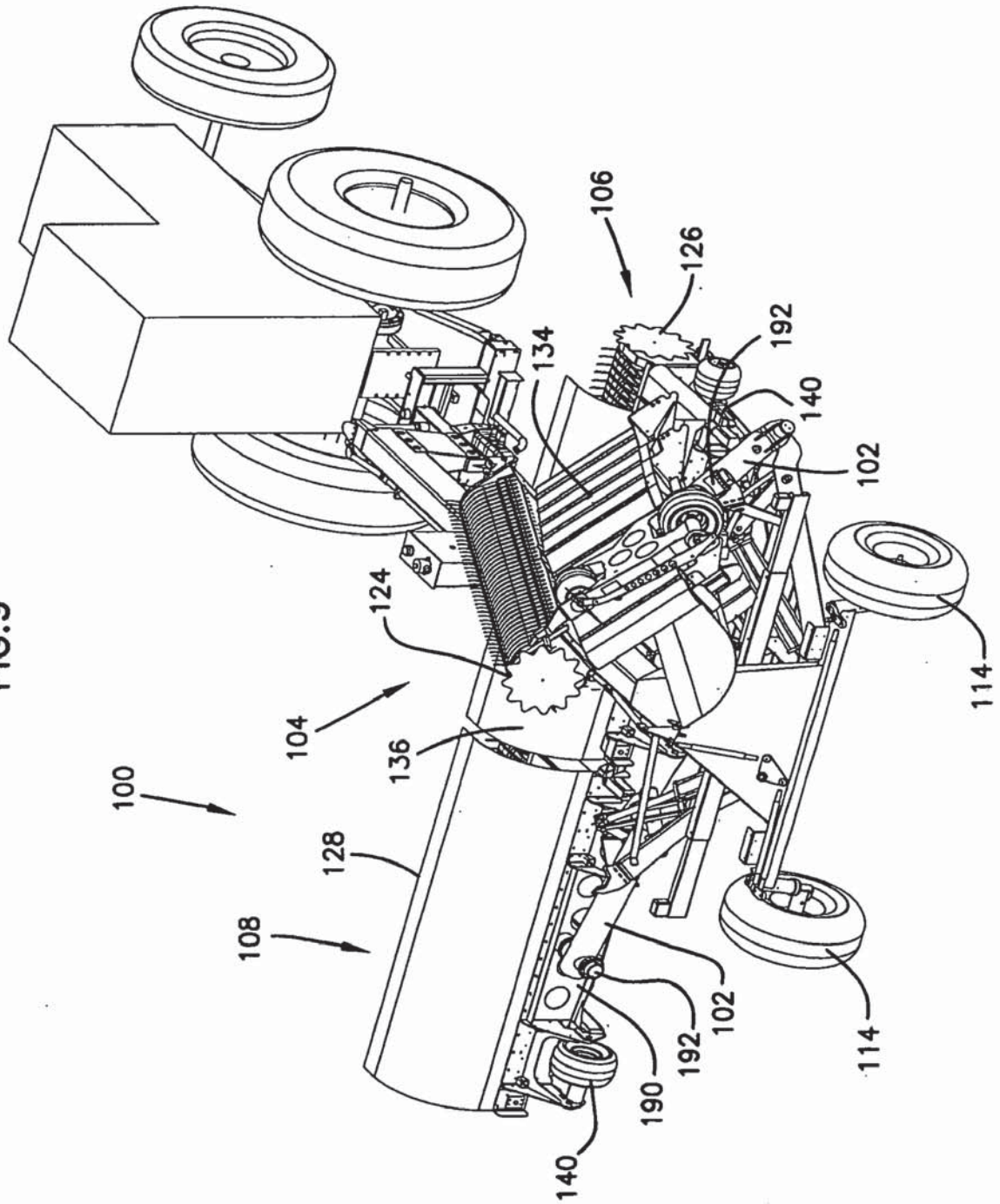
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FIG.9

FIG.10

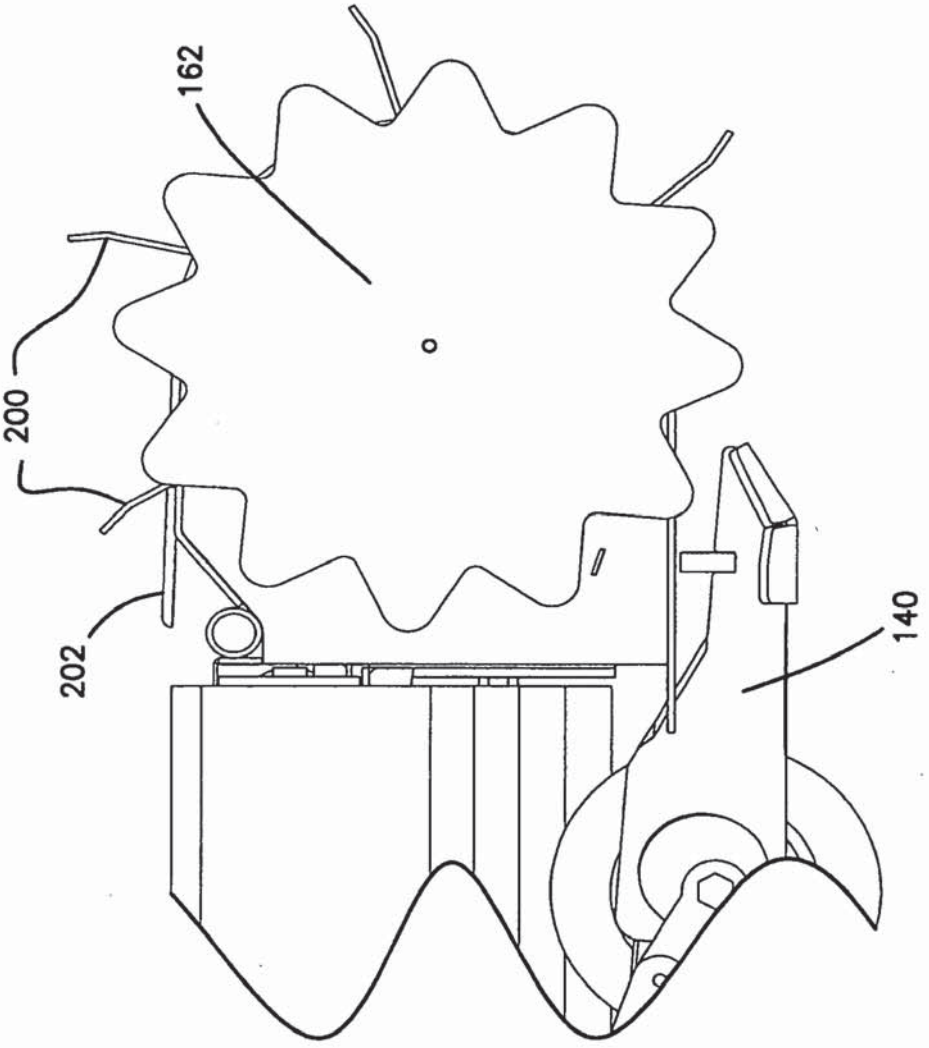
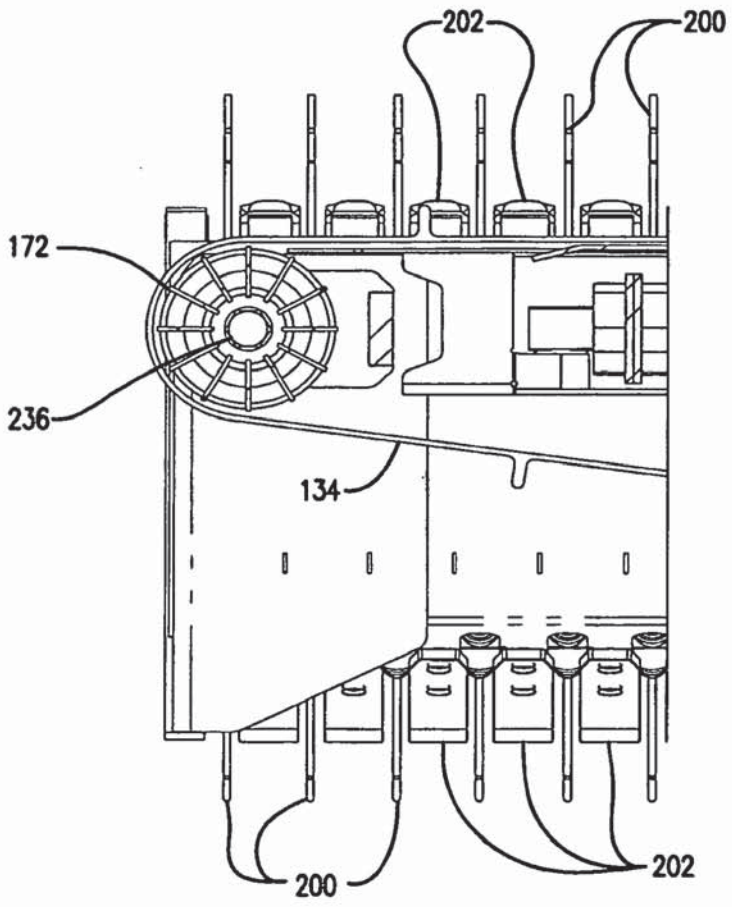


FIG. 11



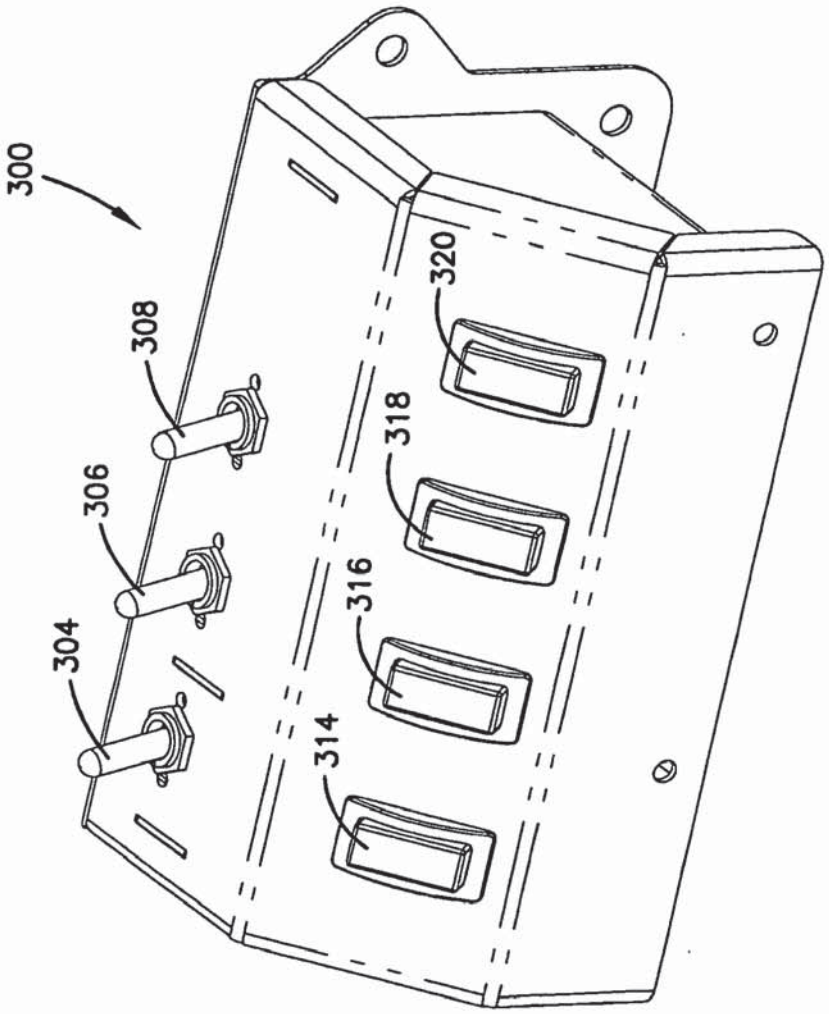


FIG. 12

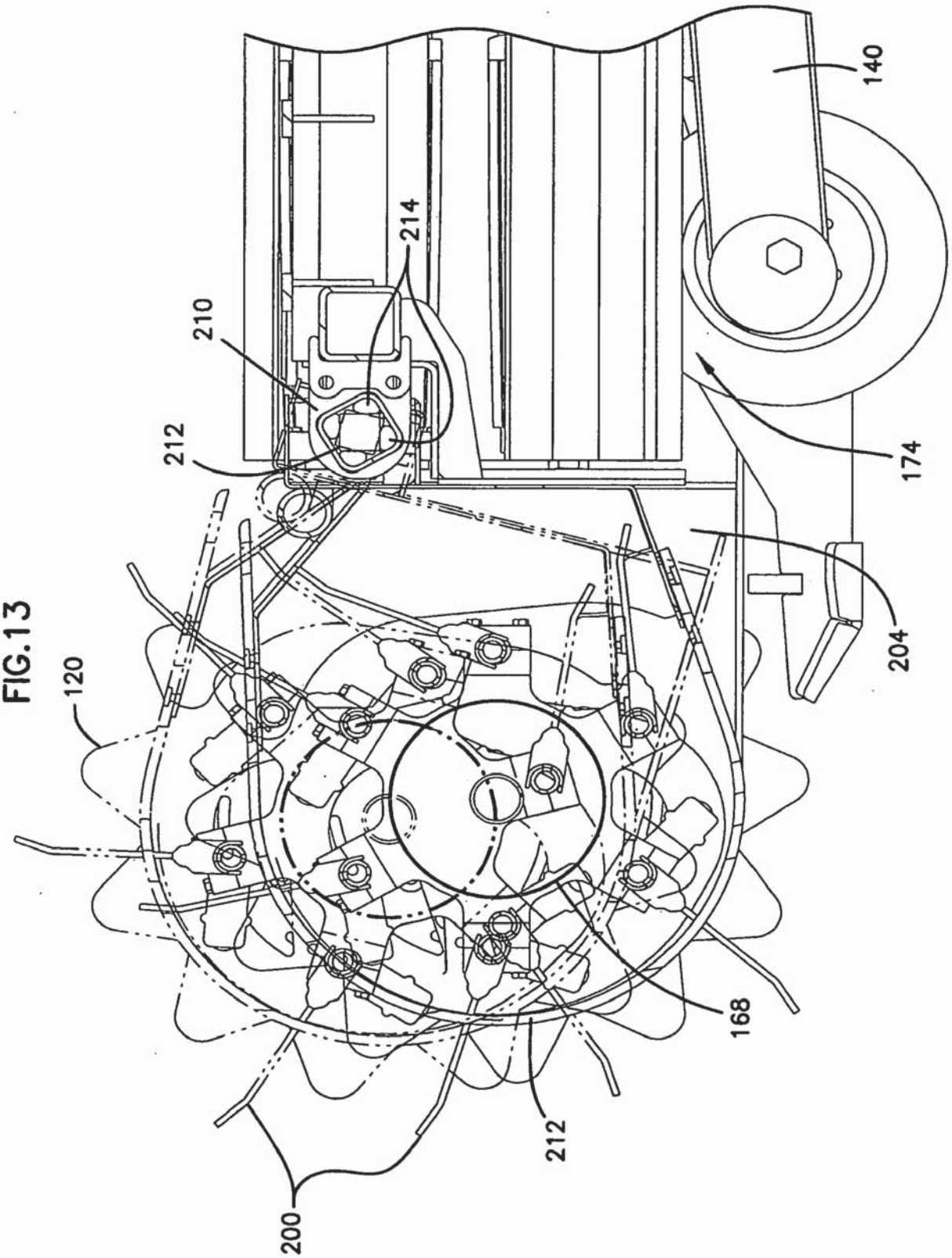


FIG. 13

FIG. 14

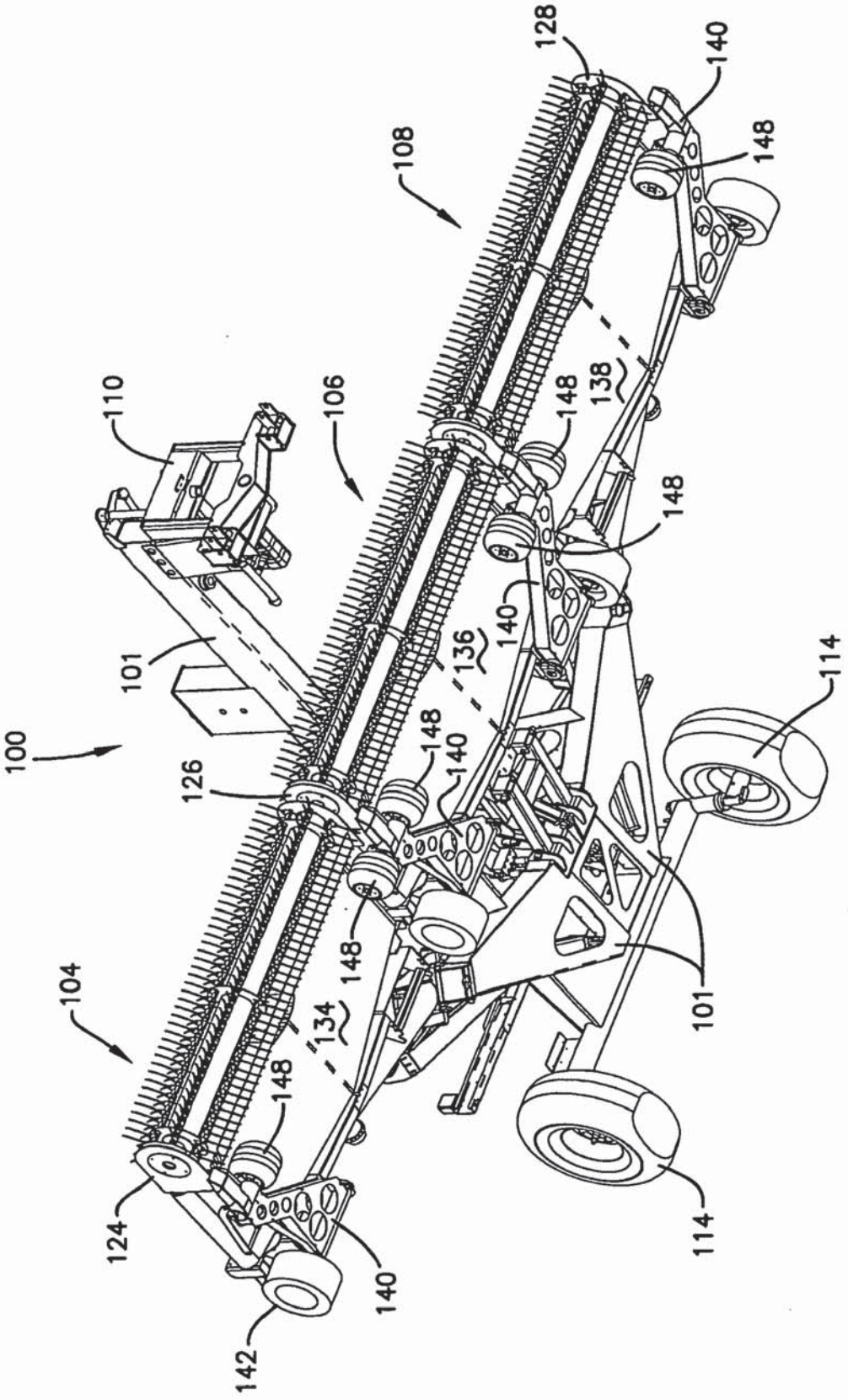
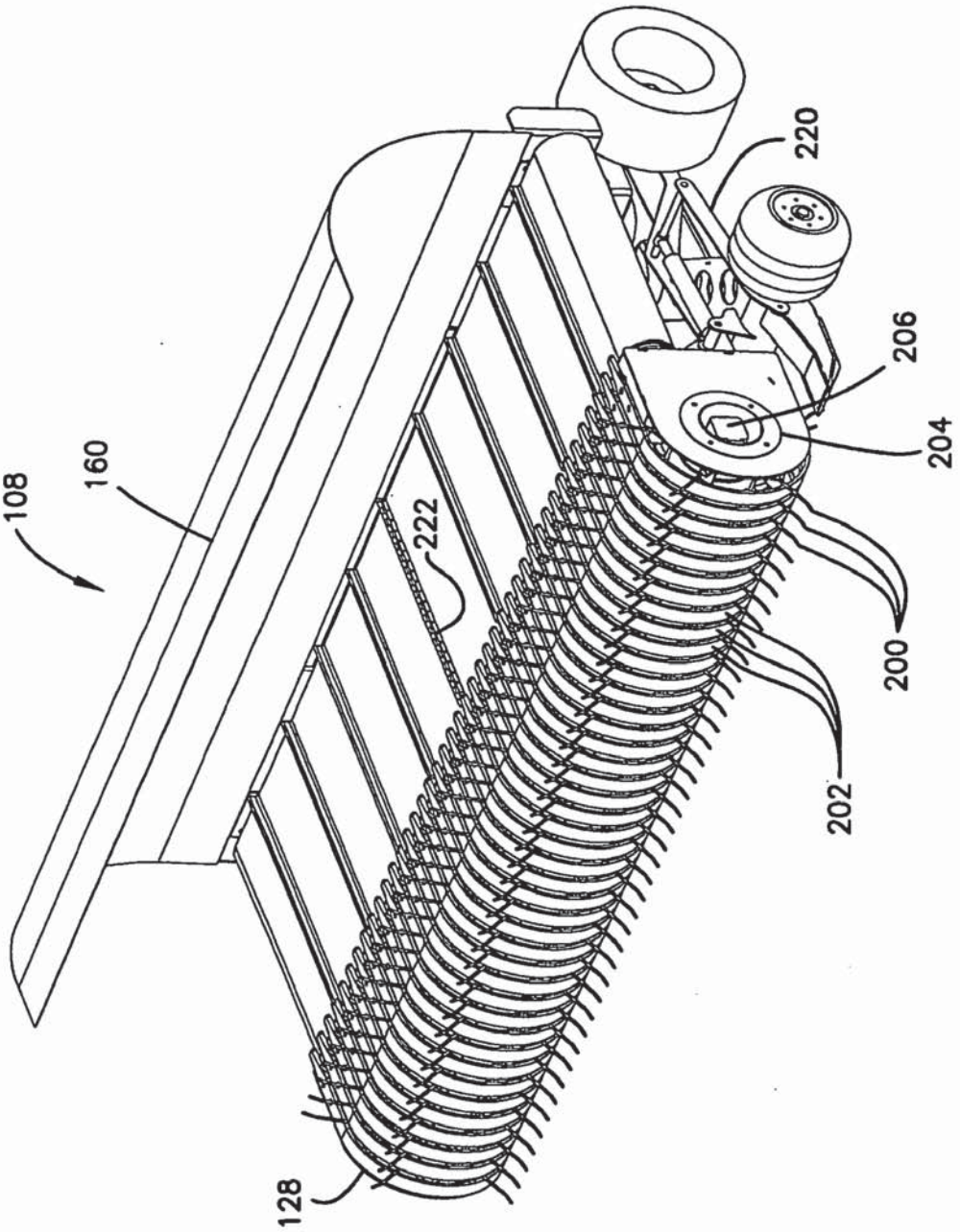


FIG. 15



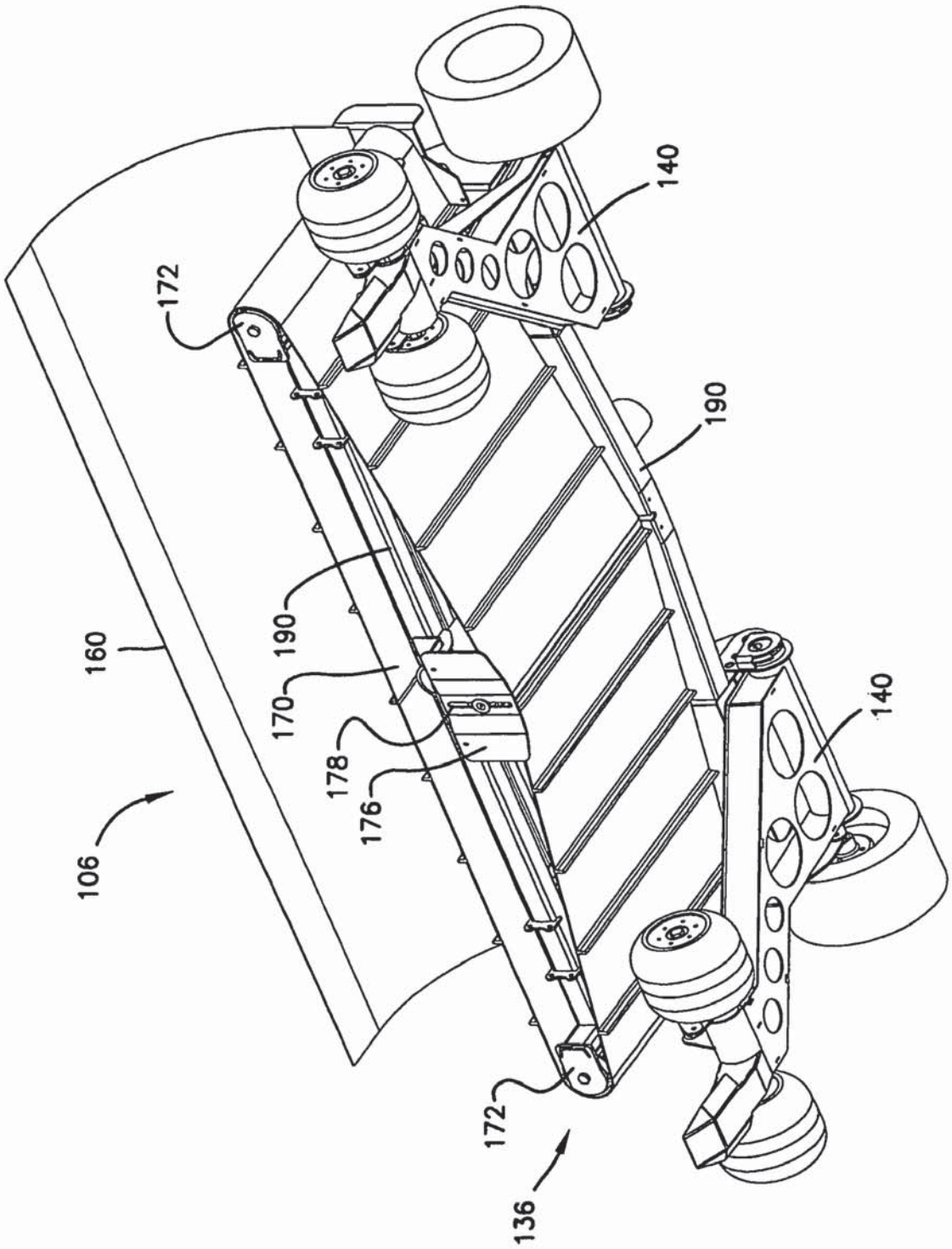


FIG.16

FIG.17

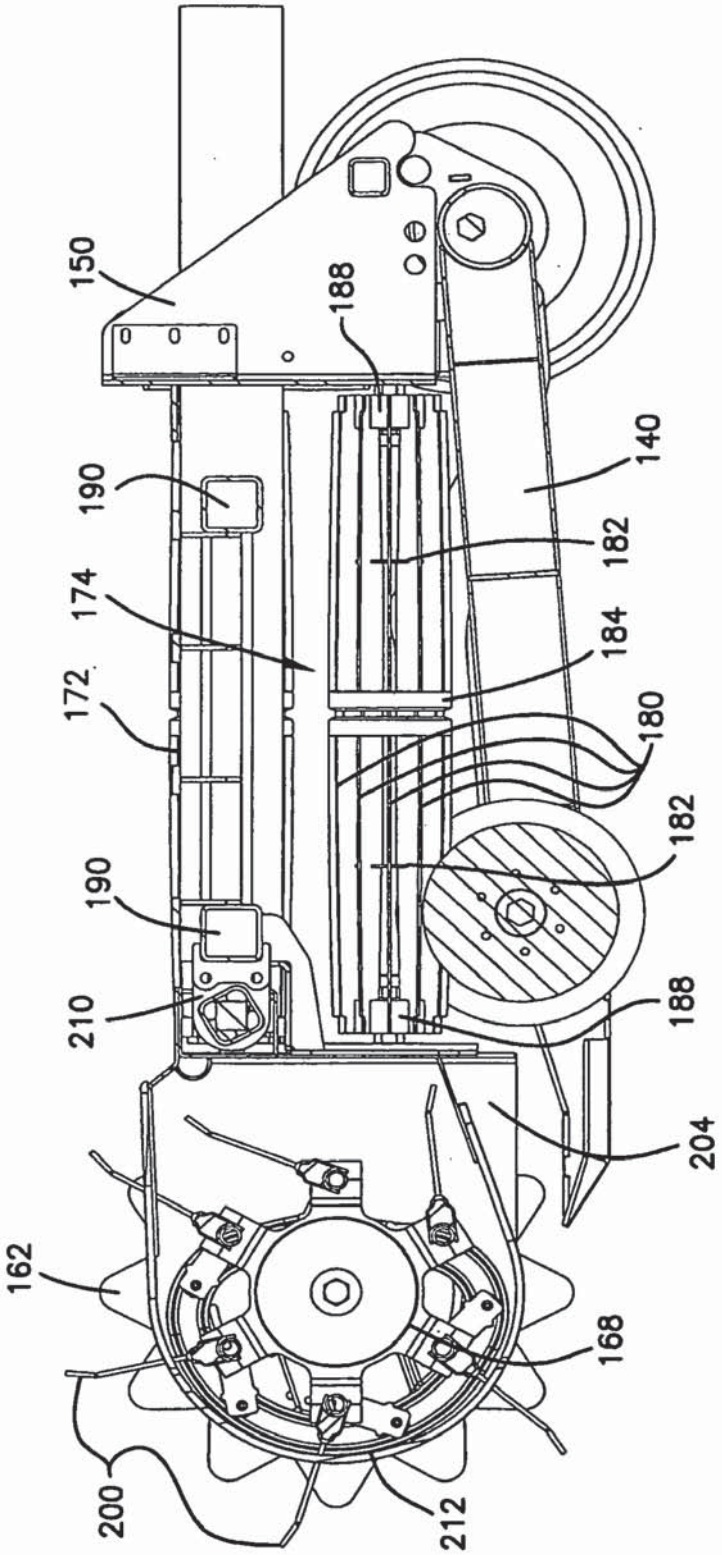

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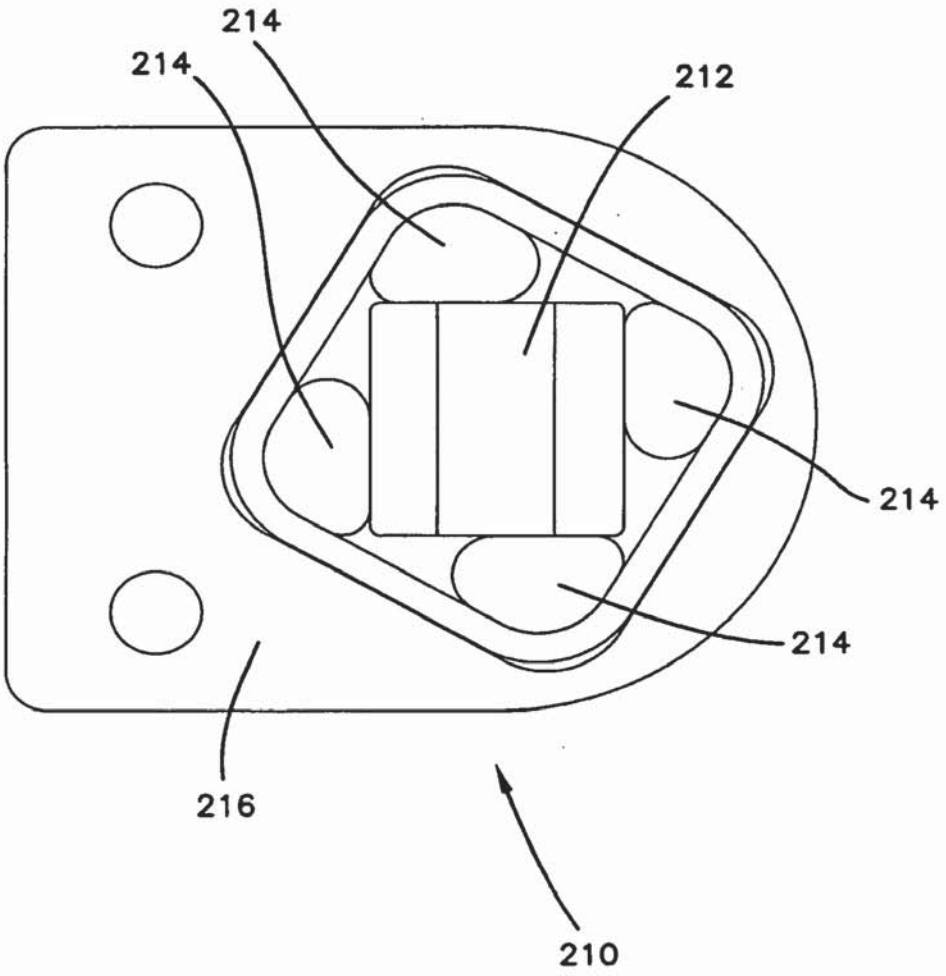
FIG. 18



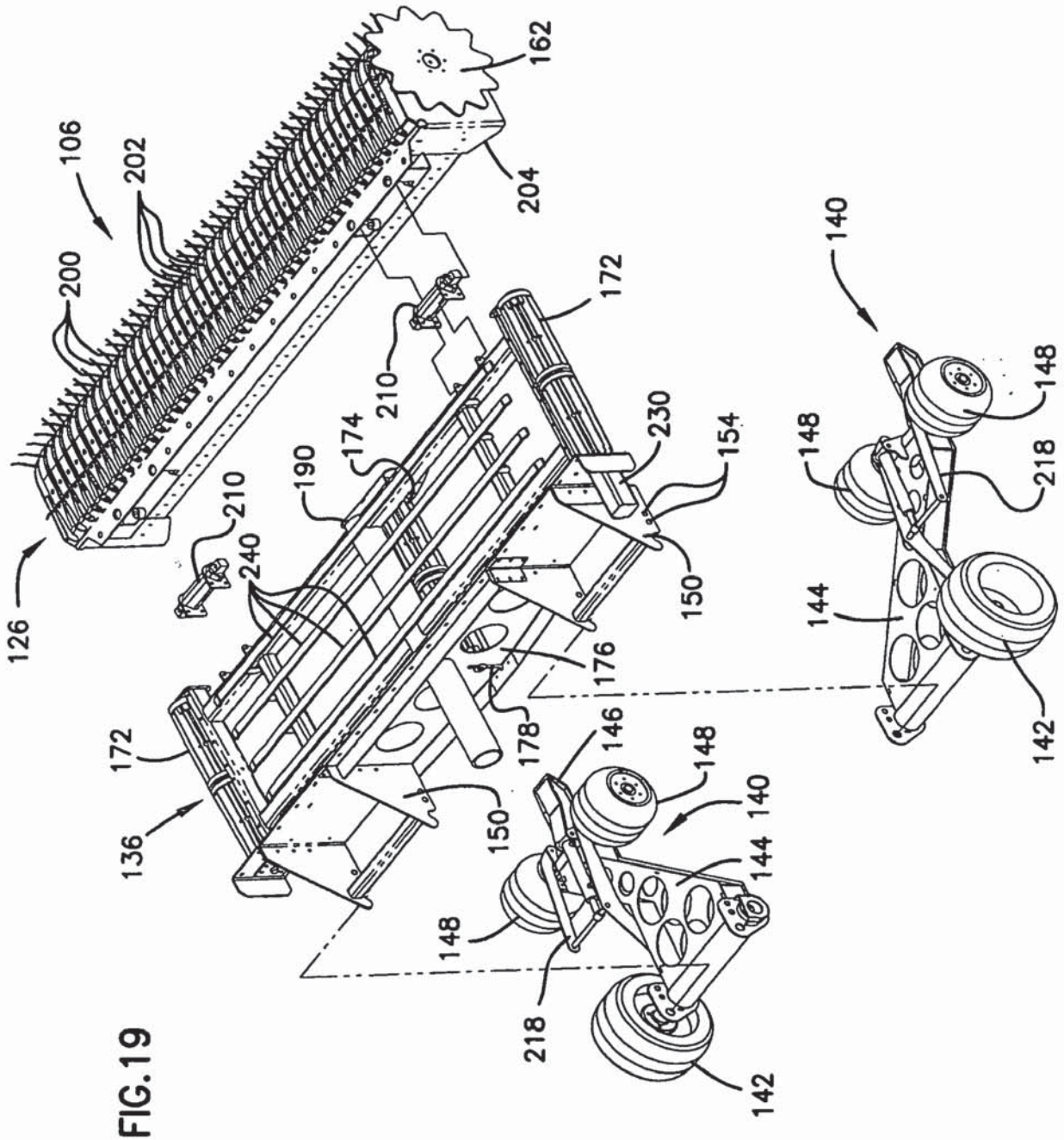

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FIG. 19

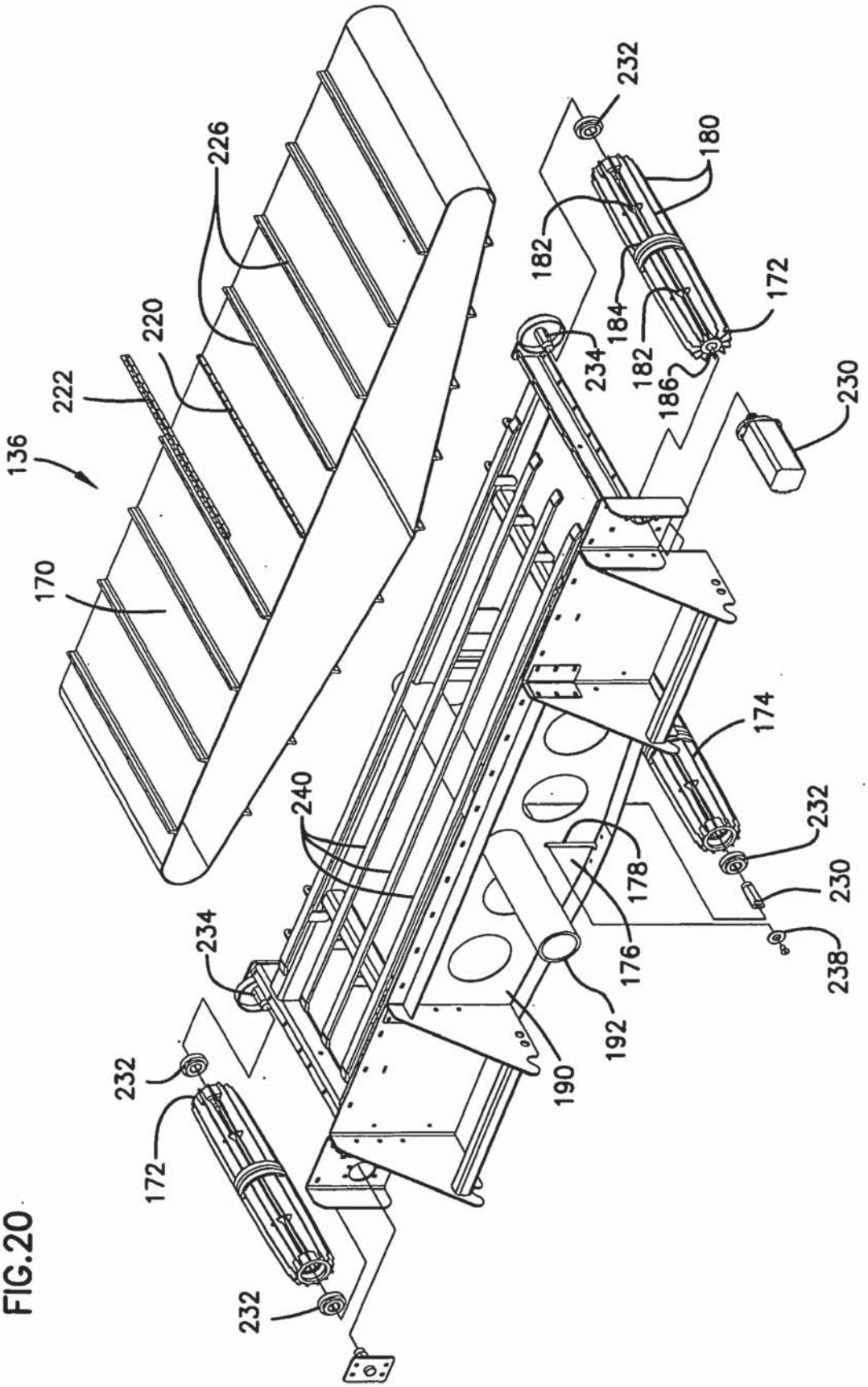
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FIG.20

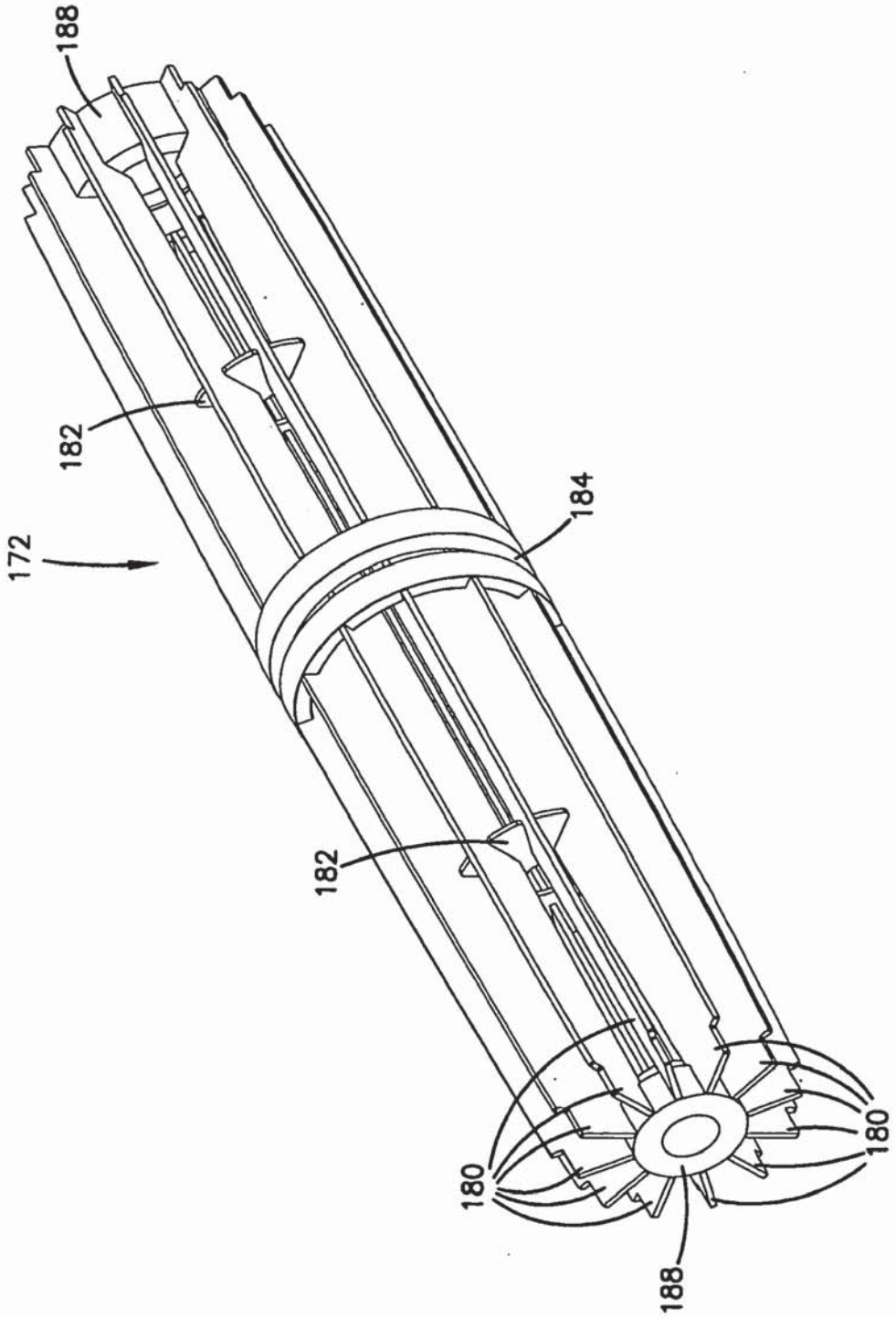

FIG.21

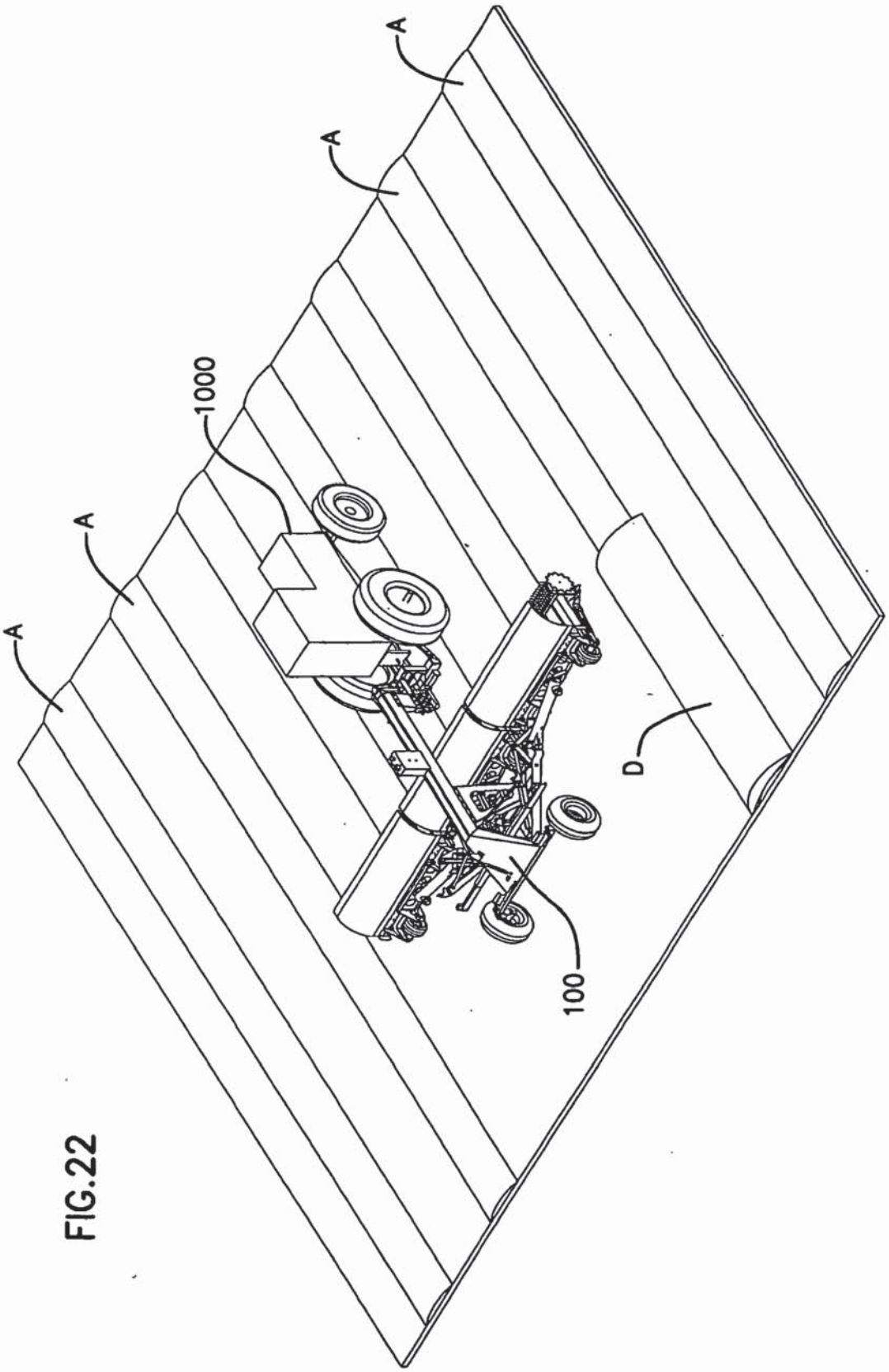

FIG.22

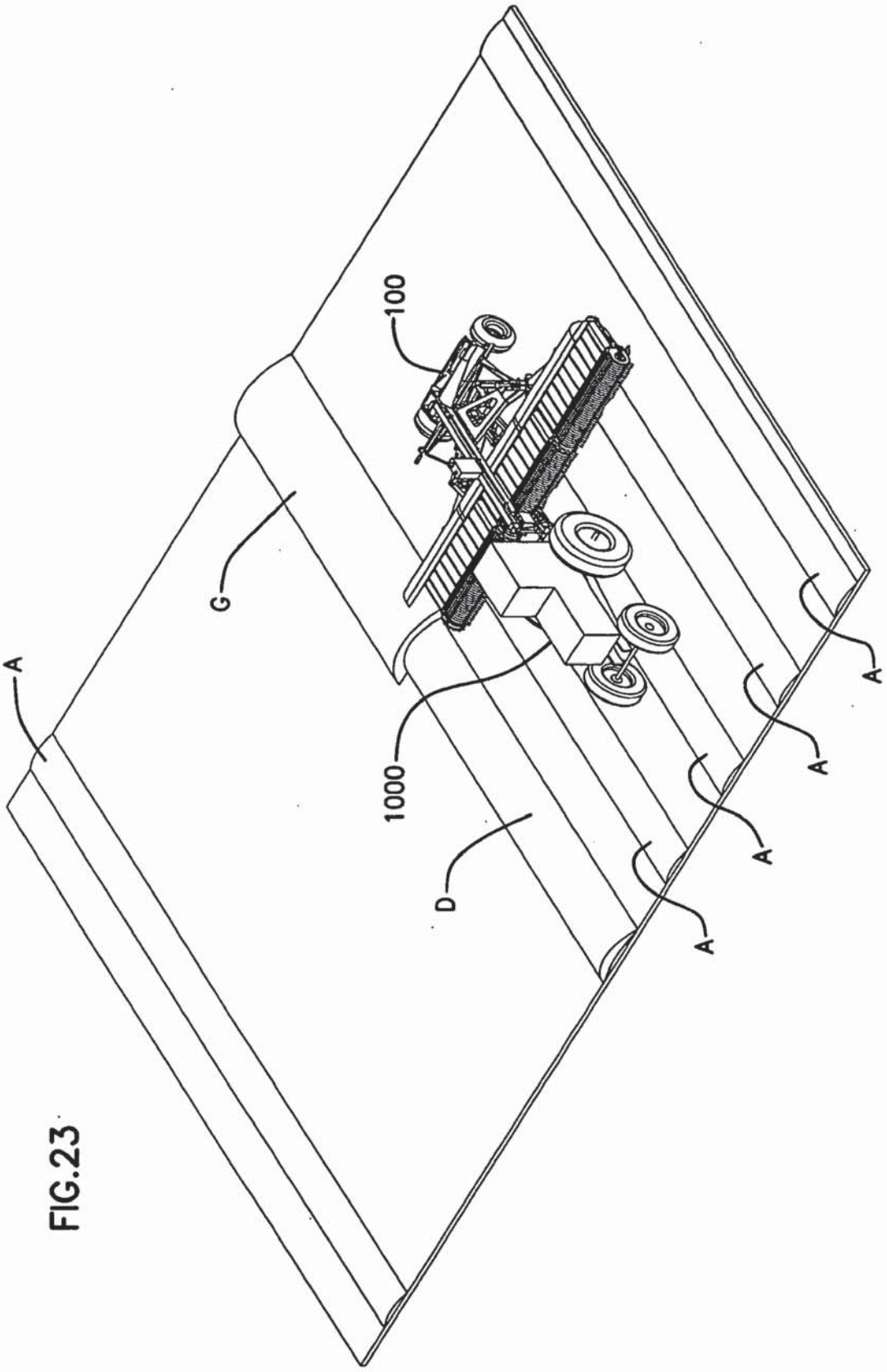

FIG.23

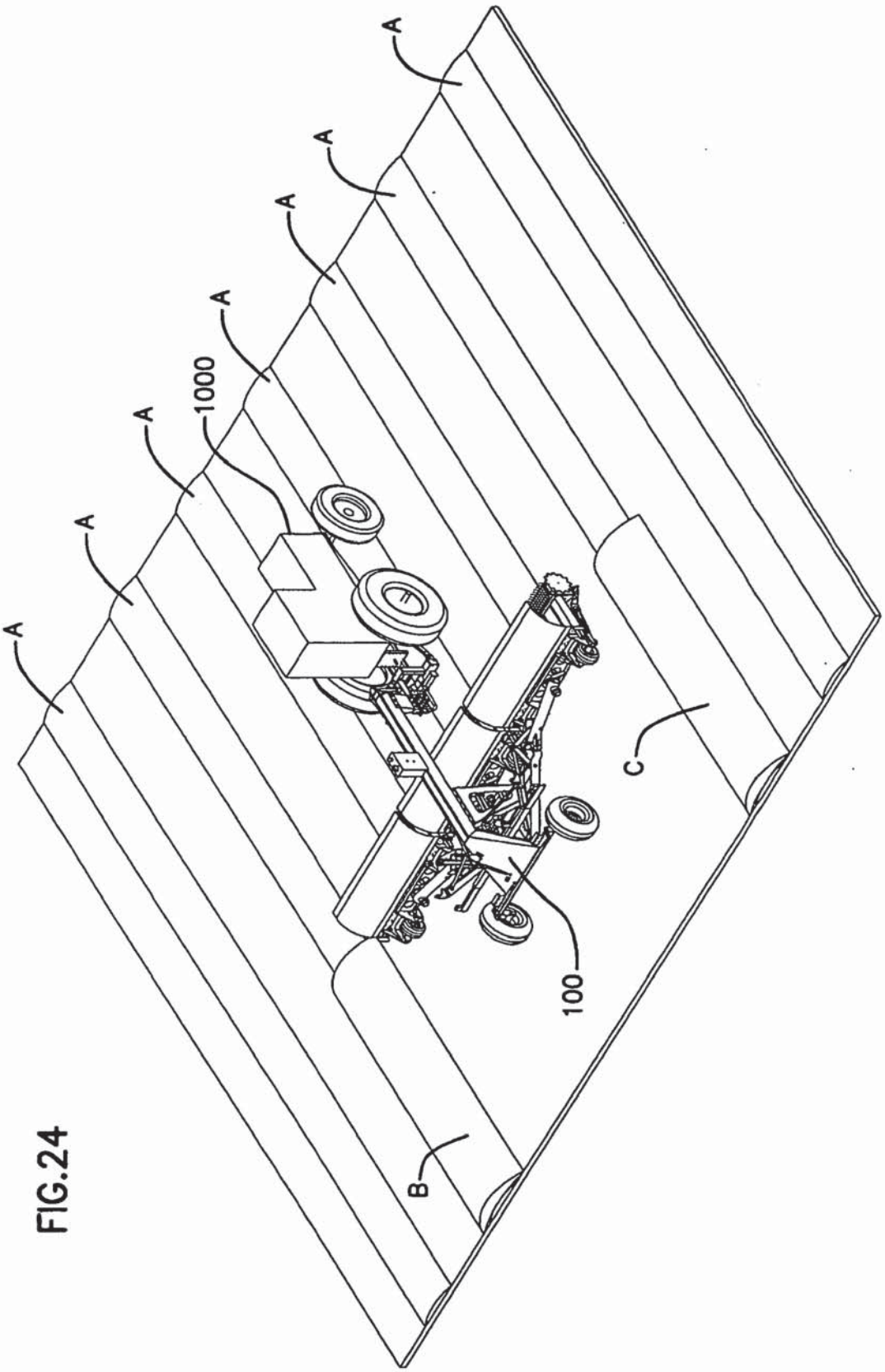

FIG.24

Attorney Docket No. 12821.16US01

MERCHANT & GOULD P.C.

United States Patent Application

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: WINDROW MERGING APPARATUS.

The specification of which
a. ☐ is attached hereto
b. ☒ was filed on March 31, 2003 as application serial no. 10/405,030 which I have reviewed and for which I solicit a United States patent.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed:

a. ☒ no such applications have been filed.
b. ☐ such applications have been filed as follows:

FOREIGN APPLICATION(S), IF ANY, CLAIMING PRIORITY UNDER 35 USC § 119			
COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)
ALL FOREIGN APPLICATION(S), IF ANY, FILED BEFORE THE PRIORITY APPLICATION(S)			
COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)

I hereby claim the benefit under Title 35, United States Code, § 120/365 of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. APPLICATION NUMBER	DATE OF FILING (day, month, year)	STATUS (patented, pending, abandoned)

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below:

U.S. PROVISIONAL APPLICATION NUMBER	DATE OF FILING (Day, Month, Year)

I acknowledge the duty to disclose information that is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, § 1.56 (reprinted below):

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

(1) prior art cited in search reports of a foreign patent office in a counterpart application, and

(2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or

(2) It refutes, or is inconsistent with, a position the applicant takes in:

(i) Opposing an argument of unpatentability relied on by the Office, or

(ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

(1) Each inventor named in the application:

(2) Each attorney or agent who prepares or prosecutes the application; and

(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

(e) In any continuation-in-part application, the duty under this section includes the duty to disclose to the Office all information known to the person to be material to patentability, as defined in paragraph (b) of this section, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby appoint the following attorney(s) and/or patent agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith:

Ali, M. Jeffer	Reg. No. 46,359
Altera, Allan G.	Reg. No. 40,274
Anderson, Gregg I.	Reg. No. 28,828
Batzli, Brian H.	Reg. No. 32,960
Beard, John L.	Reg. No. 27,612
Berns, John M.	Reg. No. 43,496
Blackburn, Murrell W.	Reg. No. 50,881
Bortolotti, Rebecca	Reg. No. 51,488
Branch, John W.	Reg. No. 41,633
Brown, Jeffrey C.	Reg. No. 41,643
Bruess, Steven C.	Reg. No. 34,130
Byrne, Linda M.	Reg. No. 32,404
Campbell, Keith	Reg. No. 46,597
Clifford, John A.	Reg. No. 30,247
Cook, Jeffrey	Reg. No. 48,649
Daignault, Ronald A.	Reg. No. 25,968
Daley, Dennis R.	Reg. No. 34,994
Daley, William J.	Reg. No. 52,471
Daulton, Julie R.	Reg. No. 36,414
DeVries Smith, Katherine M.	Reg. No. 42,157
DiPietro, Mark J.	Reg. No. 28,707
Doscotch, Matthew A.	Reg. No. 48,957
Edell, Robert T.	Reg. No. 20,187
Epp Ryan, Sandra	Reg. No. 39,667
Fitzsimmons, Karen A.	Reg. No. 50,470
Gadiano, Christina M.	Reg. No. 37,628
Gaffney, Matthew M.	Reg. No. 46,717
Goggin, Matthew J.	Reg. No. 44,125
Golla, Charles E.	Reg. No. 26,896
Gorman, Alan G.	Reg. No. 38,472
Gotfredson, Garen J.	Reg. No. 44,722
Gould, John D.	Reg. No. 18,223
Gregson, Richard	Reg. No. 41,804
Gresens, John J.	Reg. No. 33,112
Hamre, Curtis B.	Reg. No. 29,165
Hennings, Mark	Reg. No. 48,982
Hertzberg, Brett A.	Reg. No. 42,660
Hillson, Randall A.	Reg. No. 31,838
Hope, Leonard J.	Reg. No. 44,774
Hornsby, III, Alton	Reg. No. 47,299
Jacobson, Charlie A.	Reg. No. P-53,061
Johns, Nicholas P.	Reg. No. 48,995
Johnston, Scott W.	Reg. No. 39,721
Kalinsky, Robert A.	Reg. No. 50,471
Kettelberger, Denise	Reg. No. 33,924
Keys, Jeramie J.	Reg. No. 42,724
Knearl, Homer L.	Reg. No. 21,197
Korver, Joshua W.	Reg. No. 51,894
Kowalchyk, Alan W.	Reg. No. 31,535
Kowalchyk, Katherine M.	Reg. No. 36,848
Lamberty, Michael	Reg. No. 50,760
Larson, James A.	Reg. No. 40,443
Lauer, Deakin T.	Reg. No. 47,892
Leach III, Thomas J.	Reg. No. P-53,188
Leonard, Christopher J.	Reg. No. 41,940
Lewis, George C.	Reg. No. 53,214
Liepa, Mara E.	Reg. No. 40,066
McDonald, Daniel W.	Reg. No. 32,044
McIntyre, Jr., William F.	Reg. No. 44,921
Mueller, Douglas P.	Reg. No. 30,300
Nelson, Anna M.	Reg. No. 48,935
Parsons, Nancy J.	Reg. No. 40,364
Pauly, Daniel M.	Reg. No. 40,123
Peterson, Kyle T.	Reg. No. 46,989
Phillips, John B.	Reg. No. 37,206
Pino, Mark J.	Reg. No. 43,858
Qualey, Terry	Reg. No. 25,148
Randall, Joshua N.	Reg. No. 50,719
Reich, John C.	Reg. No. 37,703
Reiland, Earl D.	Reg. No. 25,767
Roath, Paul D.	Reg. No. 45,045
Schmaltz, David G.	Reg. No. 39,828
Schuman, Mark D.	Reg. No. 31,197
Schumann, Michael D.	Reg. No. 30,422
Scull, Timothy B.	Reg. No. 42,137
Sebald, Gregory A.	Reg. No. 33,280
Skoog, Mark T.	Reg. No. 40,178
Sorge, Keith M.	Reg. No. 50,865
Stewart, Alan R.	Reg. No. 47,974
Stoll-DeBell, Kirstin L.	Reg. No. 43,164
Sullivan, Timothy	Reg. No. 47,981
Swenson, Erik G.	Reg. No. 45,147
Tellekson, David K.	Reg. No. 32,314
Trembath, Jon R.	Reg. No. 38,344
Tunheim, Marcia A.	Reg. No. 42,189
Underhill, Albert L.	Reg. No. 27,403
Vidovich, Kristin K.	Reg. No. 41,448
Wahl, John R.	Reg. No. 33,044
Welter, Paul A.	Reg. No. 20,890
Whitaker, John E.	Reg. No. 42,222
Wiegand, Jamie	Reg. No. 52,361
Wier, David D.	Reg. No. 48,229
Williams, Douglas J.	Reg. No. 27,054
Withers, James D.	Reg. No. 40,376
Wong, Bryan A.	Reg. No. 50,836
Wong, Thomas S.	Reg. No. 48,577
Xia, Tim Tingkang	Reg. No. 45,242
Zeuli, Anthony R.	Reg. No. 45,255

I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/ organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct Merchant & Gould P.C. to the contrary.

I understand that the execution of this document, and the grant of a power of attorney, does not in itself establish an attorney-client relationship between the undersigned and the law firm Merchant & Gould P.C., or any of its attorneys.
Please direct all correspondence in this case to Merchant & Gould P.C. at the address indicated below:

Merchant & Gould P.C.
P.O. Box 2903
Minneapolis, MN 55402-0903

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2	Full Name Of Inventor	Family Name: DOW	First Given Name: Paul	Second Given Name: W.
0	Residence & Citizenship	City: Byron	State or Foreign Country: New York	Country of Citizenship: U.S.A.
1	Mailing Address	Address: 7232 South Byron Road	City: Byron	State & Zip Code/Country: New York 14422 U.S.A.
Signature of Inventor 201: Paul W. Dow				Date: 6/27/03
2	Full Name Of Inventor	Family Name: DOW	First Given Name: Steven	Second Given Name: S.
0	Residence & Citizenship	City: Byron	State or Foreign Country: New York	Country of Citizenship: U.S.A.
2	Mailing Address	Address: 6561 Transit Road	City: Byron	State & Zip Code/Country: New York 14422 U.S.A.
Signature of Inventor 202: Anne D Dow				Date: 6/27/03
2	Full Name Of Inventor	Family Name: WOODRUFF	First Given Name: Mark	Second Given Name: M.
0	Residence & Citizenship	City: Bergen	State or Foreign Country: New York	Country of Citizenship: U.S.A.
3	Mailing Address	Address: 7311 West Bergen Road	City: Bergen	State & Zip Code/Country: New York 14416 U.S.A.
Signature of Inventor 203: Mark M. Woodruff				Date: 6/27/03

Date 10/19/10

Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 12/925,405

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	165		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	270		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	110		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	1		x$26		OR	x$52	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*	x$110			x$220	
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $270 ($135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			195			390	
			TOTAL	545		TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2.

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))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

		(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 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))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T 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.

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 NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/925,405	10/19/2010	Paul W. Dow	12821.16USC2

CONFIRMATION NO. 1677

23552
MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

FORMALITIES LETTER

OC000000044363731

Date Mailed: 11/08/2010

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 and pay any fees required 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.
  *Applicant must submit $**165** to complete the basic filing fee for a small entity.*

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of $**65** for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this notice.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is $**610** for a small entity
- $**165** Statutory basic filing fee.
- $**65** Surcharge.
- The application search fee has not been paid. Applicant must submit $**270** to complete the search fee.
- The application examination fee has not been paid. Applicant must submit $**110** to complete the examination fee for a small entity in compliance with 37 CFR 1.27.

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.
https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

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

/thaile/

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

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 NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
12/925,405	10/19/2010	3671	0.00	12821.16USC2	1	1

CONFIRMATION NO. 1677

23552
MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

FILING RECEIPT

OC000000044363730

Date Mailed: 11/08/2010

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**

Applicant(s)

Paul W. Dow, Byron, NY;
Steven S. Dow, Byron, NY;
Mark M. Woodruff, Bergen, NY;

Assignment For Published Patent Application

Oxbo International Corporation, Byron, NY

Power of Attorney:

Gregory Sebald--33280
Steven Bruess--34130
Dennis Daley--34994
Julie Daulton--36414
David Schmaltz--39828
Mark Skoog--40178
Karen Fitzsimmons--50470
Robert Kalinsky--50471

Domestic Priority data as claimed by applicant

This application is a CON of 11/388,692 03/24/2006 PAT 7,827,774
which is a CON of 10/405,030 03/31/2003 PAT 7,310,929

Foreign Applications

If Required, Foreign Filing License Granted: 11/04/2010
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/925,405**
Projected Publication Date: To Be Determined - pending completion of Missing Parts
Non-Publication Request: No
Early Publication Request: No

** SMALL ENTITY **

Title

Windrow merging apparatus

Preliminary Class

056

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 (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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).

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	BYRON et al.	Examiner:	Unassigned
Serial No.:	12/925,405	Group Art Unit:	3671
Filed:	October 19, 2010	Docket No.:	12821.16USC2
Customer No.	23552	Confirmation No.	1677
Title:	WINDROW MERGING APPARATUS		

COMMUNICATION REGARDING SUBMISSION OF MISSING PARTS

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

Dear Sir:

In connection with the above-identified application and in reply to the Notice to File Missing Parts dated November 8, 2010, payment of the application filing fees is made.

Payment is made by credit card in the amount of $610.00 as follows: Missing Parts completion fee $65.00, Filing Fee $165.00, Search Fee $270.00, Examination Fee $110.00. Please charge any additional fees or credit overpayment to Deposit Account No. 13-2725.

23552
PATENT TRADEMARK OFFICE

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, MN 55402-0903
612/332-5300

Date: 5/9/11

Gregory A. Sebald
Reg. No. 33,280
GAS/mep

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	BYRON et al.	Examiner:	Unassigned
Serial No.:	12/925,405	Group Art Unit:	3671
Filed:	October 19, 2010	Docket No.:	12821.16USC2
Title:	WINDROW MERGING APPARATUS		

PETITION FOR EXTENSION OF TIME

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

Dear Sir:

In accordance with the provisions of 37 C.F.R. §1.136(a), it is respectfully requested that a four-month extension of time be granted in which to respond to the communication mailed November 8, 2010, the period of response being extended from December 8, 2010 to May 8, 2011.

The fee of $865.00 to cover the required extension fee for a small entity will be paid on line via an authorized credit card.

23552
PATENT TRADEMARK OFFICE

Respectfully submitted,

MERCHANT & GOULD P.C.

Dated: 5/9/11

By: _____
Gregory A. Sebald
Reg. No. 33,280
GAS/mep

Electronic Patent Application Fee Transmittal

Application Number:	12925405
Filing Date:	19-Oct-2010
Title of Invention:	Windrow merging apparatus
First Named Inventor/Applicant Name:	Paul W. Dow
Filer:	Gregory A. Sebald/Mary Peterson
Attorney Docket Number:	12821.16USC2

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility Search Fee	2111	1	270	270
Utility Examination Fee	2311	1	110	110
Utility filing Fee(efiling)-Small Entity	2011	1	165	165
Pages:				
Claims:				
Miscellaneous-Filing:				
Late filing fee for oath or declaration	2051	1	65	65
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 4 months with $0 paid	2254	1	865	865
Miscellaneous:				
		Total in USD ($)		**1475**

Electronic Acknowledgement Receipt

EFS ID:	10051653
Application Number:	12925405
International Application Number:	
Confirmation Number:	1677
Title of Invention:	Windrow merging apparatus
First Named Inventor/Applicant Name:	Paul W. Dow
Customer Number:	23552
Filer:	Gregory A. Sebald/Mary Peterson
Filer Authorized By:	Gregory A. Sebald
Attorney Docket Number:	12821.16USC2
Receipt Date:	09-MAY-2011
Filing Date:	19-OCT-2010
Time Stamp:	17:56:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1475
RAM confirmation Number	5210
Deposit Account	132725
Authorized User	SEBALD,GREGORY A.

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 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance 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	MPtransmittal.pdf	34806 32739a0dd565431458d9be48c2c8ad944741c087	no	1
Warnings:					
Information:					
2	Extension of Time	ext.pdf	28630 0ecf5ba0846eb55d420bd14f59ff3eaaf806cf98	no	1
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	38503 9a4224b2a1961417a6fee769e0df3c5e0699e0ae	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	101939		

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.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 12/925,405

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	165		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	270		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	110		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	1 minus 20 =	*	x 26 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*	x 110 =	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 $270 ($135 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	545		TOTAL	

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	

		(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 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.

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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
12/925,405	10/19/2010	3671	610	12821.16USC2	1	1

CONFIRMATION NO. 1677

UPDATED FILING RECEIPT

23552
MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

OC000000047694919

Date Mailed: 05/18/2011

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**

Applicant(s)

Paul W. Dow, Byron, NY;
Steven S. Dow, Byron, NY;
Mark M. Woodruff, Bergen, NY;

Assignment For Published Patent Application

Oxbo International Corporation, Byron, NY

Power of Attorney:

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Julie Daulton--36414
David Schmaltz--39828
Mark Skoog--40178
Karen Fitzsimmons--50470
Robert Kalinsky--50471

Domestic Priority data as claimed by applicant

This application is a CON of 11/388,692 03/24/2006 PAT 7,827,774
which is a CON of 10/405,030 03/31/2003 PAT 7,310,929

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)

If Required, Foreign Filing License Granted: 11/04/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/925,405**

Projected Publication Date: 08/25/2011

Non-Publication Request: No

Early Publication Request: No
** **SMALL ENTITY** **
Title

Windrow merging apparatus

Preliminary Class

056

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 (1-866-999-4158).

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.

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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).

Notice of References Cited	Application/Control No. 12/925,405	Applicant(s)/Patent Under Reexamination DOW ET AL.	
	Examiner ALICIA TORRES	Art Unit 3671	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-4,409,780	10-1983	Beougher et al.	56/228
*	B	US-4,658,572	04-1987	Honey et al.	56/228
*	C	US-4,768,334	09-1988	Honey et al.	56/228
*	D	US-5,911,625	06-1999	von Allworden, Willhelm	460/119
*	E	US-6,205,757	03-2001	Dow et al.	56/366
*	F	US-7,310,929	12-2007	Dow et al.	56/192
*	G	US-7,827,774	11-2010	Dow et al.	56/192
	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.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/925,405	10/19/2010	Paul W. Dow	12821.16USC2	1677

23552 7590 06/24/2011

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

EXAMINER	
TORRES, ALICIA M	

ART UNIT	PAPER NUMBER
3671	

MAIL DATE	DELIVERY MODE
06/24/2011	PAPER

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.

Office Action Summary	Application No.	Applicant(s)	
	12/925,405	DOW ET AL.	
	Examiner	Art Unit	
	ALICIA TORRES	3671	

-- 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 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 *19 October 2010*.

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

3)☐ 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

4)☒ Claim(s) *1* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

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

Application Papers

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

10)☐ 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☐ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 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 –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Beougher et al. 4,409,780.

3. Beougher et al. disclose a windrow merger, comprising:

a merger assembly including a center pick up head (17), a left pick up head (18), and a right pick up head (18), each of the center, left, and right pick up heads (17, 18, 18) having a length, the left and right pick up heads (18, 18) each being positionable in an extended use position (Figure 2) and a retracted travel position (Figures 1 and 5);

wherein the lengths of the left and right pick up heads (18, 18) are generally transverse to a direction of travel when positioned in the extended use position (as seen in Figure 2), and wherein the lengths of the left and right pick up heads (18, 18) are generally aligned with the direction of travel when position in the retracted travel position (as seen in Figures 1 and 5), the left and right pick up heads (18, 18) further being located above the center pick up (17) head when positioned in the retracted travel position (seen in Figures 1 and 5).

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please see the attached PTO-892.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia M. Torres whose telephone number is 571-272-6997. The examiner can normally be reached Monday through Friday from 8:00 a.m. – 5:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas B. Will, can be reached at 571-272-6998.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist whose telephone number is 571-272-3600. The fax number for this Group is 571-273-8300.

/Alicia M Torres/
Primary Examiner, Art Unit 3671
June 20, 2011

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	16	"56"/$.ccls. and dow.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2011/06/20 12:56
S2	16	"56"/$.ccls. and woodruff.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2011/06/20 12:57
S3	5	(("7310929") or ("6205757")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2011/06/20 13:01
S4	224	(US-20010018861-$ or US-20050126153-$ or US-20060254244-$ or US-20060248870-$ or US-20040200203-$ or US-20070033915-$ or US-20070144130-$). did. or (US-6205757-$ or US-5507139-$ or US-5272860-$ or US-4910951-$ or US-5203154-$ or US-6401440-$ or US-6658828-$ or US-6119792-$ or US-6178728-$ or US-5893262-$ or US-5155986-$ or US-4996833-$ or US-4977734-$ or US-5177944-$ or US-4184314-$ or US-4723404-$ or US-6688093-$ or US-6675568-$ or US-6508050-$ or US-	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2011/06/20 13:03

		5313772-$ or US-5243810-$ or US-5845472-$ or US-4934131-$ or US-4932196-$ or US-4715172-$ or US-4682462-$).did. or (US-4768334-$ or US-4738092-$ or US-4658572-$ or US-4573309-$ or US-4519190-$ or US-4512140-$ or US-4503660-$ or US-4487004-$ or US-4522018-$ or US-4429517-$ or US-4346909-$ or US-4409780-$ or US-4185445-$ or US-4329833-$ or US-3897832-$ or US-3739560-$ or US-4034623-$ or US-3695015-$ or US-3714766-$ or US-3910605-$ or US-5911625-$ or US-3738682-$ or US-5609214-$ or US-5111636-$ or US-3650096-$ or US-4793129-$ or US-4956966-$).did. or (US-RE34921-$ or US-5463857-$ or US-4232747-$ or US-3948327-$ or US-3709360-$ or US-3699754-$ or US-3762140-$ or US-5964077-$ or US-3724183-$ or US-4023622-$ or US-5319911-$ or US-6508606-$ or US-6457295-$ or US-6196555-$ or US-6151874-$ or US-6139301-$ or US-5947516-$ or US-5025892-$ or US-					

		6694861-$ or US-6234061-$ or US-4386552-$ or US-4286386-$ or US-4121504-$ or US-4402367-$ or US-4088346-$ or US-4015366-$ or US-3214002-$).did. or (US-3515408-$ or US-2811003-$ or US-2168266-$ or US-1792691-$ or US-3497051-$ or US-3343347-$ or US-1877770-$ or US-2343583-$ or US-3403365-$ or US-2195381-$ or US-2507635-$ or US-2666518-$ or US-3240005-$).did. or (DE-4225249-$ or EP-439068-$ or EP-622007-$ or GB-2246938-$ or WO-8706793-$ or EP-269829-$ or DE-3610865-$ or DE-3535683-$ or EP-114983-$).did. or (JP-06133602-$ or JP-06261602-$ or JP-01293284-$).did. or (EP-853872-$ or DE-10007433-$ or EP-893290-$ or GB-2297309-$ or EP-724541-$ or DE-3018225-$ or FR-2663189-$ or GB-2194422-$).did.				
S5	445	(56/228).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2011/06/20 13:09

S6	821	(56/192).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2011/06/20 13:09

EAST Search History (Interference)

<This search history is empty>

6/20/2011 3:38:08 PM
C:\Documents and Settings\atorres\My Documents\EAST\Workspaces\12925405.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12925405	DOW ET AL.
	Examiner	Art Unit
	ALICIA TORRES	3671

SEARCHED			
Class	Subclass	Date	Examiner
56	192,228	6/20/11	AT

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor Name Search	6/20/11	AT
EAST Search	6/20/11	AT

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

	/ALICIA TORRES/ Primary Examiner.Art Unit 3671

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BIB DATA SHEET

CONFIRMATION NO. 1677

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
12/925,405	10/19/2010	056	3671	12821.16USC2

APPLICANTS

Paul W. Dow, Byron, NY;
Steven S. Dow, Byron, NY;
Mark M. Woodruff, Bergen, NY;

**** CONTINUING DATA ***************************

This application is a CON of 11/388,692 03/24/2006 PAT 7,827,774
which is a CON of 10/405,030 03/31/2003 PAT 7,310,929

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

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
11/04/2010

Foreign Priority claimed	35 USC 119(a-d) conditions met	Verified and Acknowledged	Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ Yes ☑ No	☐ Yes ☑ No	/ALICIA M TORRES/ Examiner's Signature	☐ Initials	NY	24	1	1

ADDRESS

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903
UNITED STATES

TITLE

Windrow merging apparatus

FILING FEE RECEIVED		
610	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/925,405	10/19/2010	Paul W. Dow	12821.16USC2

CONFIRMATION NO. 1677

23552
MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

PUBLICATION NOTICE

OC000000049498237

Title: Windrow merging apparatus

Publication No.US-2011-0203244-A1
Publication Date:08/25/2011

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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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/925,405	10/19/2010	Paul W. Dow	12821.16USC2	1677

23552 7590 08/26/2011

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

EXAMINER	
TORRES, ALICIA M	

ART UNIT	PAPER NUMBER
3671	

MAIL DATE	DELIVERY MODE
08/26/2011	PAPER

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

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Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	12/925,405	DOW ET AL.	
	Examiner	Art Unit	
	ALICIA TORRES	3671	

All participants (applicant, applicant's representative, PTO personnel):

(1) *ALICIA TORRES*.

(2) *GREGORY SEBALD*.

(3) *GEORGE MICHAELS*.

(4) *PAUL DOW*.

Date of Interview: *23 August 2011*.

Type: ☐ Telephonic ☐ Video Conference
☒ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1,7 and 9*.

Identification of prior art discussed: *Beoughor et al. 4,409,780*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

The examiner agrees that proposed dependent claim 9 would be allowable if written in independent form to include propsed independent claim 7. The examiner will contact the applicant if the official amendment is not in condition for allowance.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☒ Attachment

/Alicia M Torres/ Primary Examiner, Art Unit 3671	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Doc Code: M865 or FAI.REQ.INTV

PTOL-413A (08-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Applicant Initiated Interview Request Form

Application No.: 12/925,405 First Named Applicant: Paul W. Dow
Examiner: Alicia M. Torres Art Unit: 3671 Status of Application: Pending

Tentative Participants:
(1) Gregory A. Sebald (2) Paul W. Dow
(3) George Michaels (4) _____

Proposed Date of Interview: August 23, 2011 **Proposed Time:** 10:00 A.M. **(AM/PM)**

Type of Interview Requested:
(1) [ ] Telephonic (2) [✓] Personal (3) [ ] Video Conference

Exhibit To Be Shown or Demonstrated: [ ] YES [✓] NO
If yes, provide brief description: _____

Issues To Be Discussed

Issues (Rej., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
(1)			[ ]	[ ]	[ ]
(2)			[ ]	[ ]	[ ]
(3)			[ ]	[ ]	[ ]
(4)			[ ]	[ ]	[ ]

[ ] Continuation Sheet Attached [X] Proposed Amendment or Arguments Attached
Brief Description of Arguments to be Presented: Review of Response and possible update for 12/321,374

An interview was conducted on the above-identified application on _____

NOTE: This form should be completed and filed by applicant in advance of the interview (see MPEP § 713.01). If this form is signed by a registered practitioner not of record, the Office will accept this as an indication that he or she is authorized to conduct an interview on behalf of the principal (37 CFR 1.32(a)(3)) pursuant to 37 CFR 1.34. This is not a power of attorney to any above named practitioner. See the Instruction Sheet for this form, which is incorporated by reference. By signing this form, applicant or practitioner is certifying that he or she has read the Instruction Sheet. After the interview is conducted, applicant is advised to file a statement of the substance of this interview (37 CFR 1.133(b)) as soon as possible. This application will not be delayed from issue because of applicant's failure to submit a written record of this interview.

Applicant/Applicant's Representative Signature

Examiner/SPE Signature

Gregory A. Sebald
Typed/Printed Name of Applicant or Representative

33,280
Registration Number, if applicable

This collection of information is required by 37 CFR 1.133. 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 1.11 and 1.14. This collection is estimated to take 24 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.

Claims for discussion

U.S. Patent Application 12/925,405

1. (CURRENTLY AMENDED) A windrow merger, comprising:

a frame;

a merger assembly including a center pick up head mounted to the frame, a left pick up head mounted to the frame, and a right pick up head mounted to the frame, each of the center, left, and right pick up heads having a length, the left and right pick up heads each being positionable in an extended use position and a retracted travel position;

wherein the lengths of the left and right pick up heads are aligned and generally transverse to a direction of travel when positioned in the extended use position, and wherein the lengths of the left and right pick up heads are generally aligned with the direction of travel when ~~position~~ positioned in the retracted travel position, the left and right pick up heads further being located above the center pick up head when positioned in the retracted travel position.

2. (NEW) A windrow merger according to claim 1, wherein the merger is operable with at least one of the heads in the travel position.

3. (NEW) A windrow merger according to claim 1, wherein each of the heads is independently driven.

4. (NEW) A windrow merger according to claim 1, wherein each of the heads includes a pick up assembly and a belt conveyor assembly and a dedicated motor driving the pick up assembly and the belt conveyor assembly.

5. (NEW) A windrow merger according to claim 4, wherein each of the belt conveyors can operate in either direction independently of the other belt conveyors.

6. (NEW) A windrow merger according to claim 1, wherein the heads are uncoupled from one another in all positions.

7. (NEW) A windrow merger apparatus configured for travel in a first direction, comprising:

a frame;

a first pickup assembly supported by the frame, the first pickup assembly including a first belt conveyor arranged to convey material in a direction transverse to the first direction of travel and driven by a first motor;

a second pickup assembly supported by the frame, the second pickup assembly including a second belt conveyor arranged to convey material in a direction transverse to the first direction of travel and driven by a second motor; and

a third pickup assembly supported by the frame, the third pickup assembly including a third belt conveyor arranged to convey material in a direction transverse to the first direction of travel and driven by a third motor;

wherein at least two of the pickup assemblies are foldable between an extended position and a retracted position, each of the first, second, and third pickup assemblies being aligned side by side when each of the pickup assemblies is positioned in the extended position such that the first, second, and third pickup assemblies provide an unobstructed continuous line of material pickup.

8. (NEW) A windrow merger apparatus according to claim 7, wherein the merger is operable with at least one of the pickup assemblies in the retracted position.

9. (NEW) A windrow merger apparatus according to claim 7, each of the first, second and third belt conveyors being operable in either direction independently of the other belt conveyors.

10. (NEW) A windrow merger apparatus according to claim 7, wherein each of the first second and third belt conveyors is independently driven.

11. (NEW) A windrow merger apparatus according to claim 7, the pickup assemblies being uncoupled from one another in all positions.

12. (NEW) A windrow merger, comprising:

a frame;

a merger assembly including a center pick up head including a first belt conveyor, a left pick up head including a second belt conveyor, and a right pick up head including a third belt conveyor, each of the center, left, and right pick up heads having a length, the left and right pick up heads each being positionable in an extended position and a retracted position;

wherein the first belt conveyor, the second belt conveyor and the third belt conveyor are aligned with the lengths of the left and right pick up heads being generally transverse to a direction of travel when positioned in the extended position.

13. (NEW) A windrow merger according to claim 12, wherein:

the center pick up head includes a first motor driving the first belt conveyor,

the left pick up head includes a second motor driving the second belt conveyor,

the right pick up head includes a third motor driving the third belt conveyor.

14. A windrow merger, comprising:

a frame;

a merger assembly including a center pick up head including a first conveyor and a first conveyor motor, a left pick up head including a second conveyor and a second conveyor motor, and a right pick up head frame including a third conveyor and a third conveyor motor, each of the center, left, and right pick up heads having a length, the left

and right pick up heads each being positionable in an extended position and a retracted position;

wherein the first conveyor, the second conveyor and the third conveyor are aligned with the lengths of the left and right pick up heads being generally transverse to a direction of travel when positioned in the extended position.

15. (NEW) A windrow merger apparatus configured for travel in a first direction, comprising:

a frame;

a first pickup assembly including a first belt conveyor arranged to convey material in a direction transverse to the first direction of travel;

a second pickup assembly including a second belt conveyor arranged to convey material in a direction transverse to the first direction of travel; and

a third pickup assembly including a third belt conveyor arranged to convey material in a direction transverse to the first direction of travel;

wherein at least two of the pickup assemblies are foldable between an extended position and a retracted position, each of the first, second, and third pickup assemblies being aligned side by side when each of the pickup assemblies is positioned in the extended use position such that the first, second, and third pickup assemblies provide a continuous line of material pickup.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	BYRON et al.	Examiner:	Alicia M. Torres
Serial No.:	12/925,405	Group Art Unit:	3671
Filed:	October 19, 2010	Docket No.:	12821.0016USC2
Customer No.	23552	Confirmation No.	1677
Title:	WINDROW MERGING APPARATUS		

EXAMINER INTERVIEW SUMMARY

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

Applicants conducted an Examiner interview on August 23, 2011. Present at the U.S. Patent Office were Examiner Alicia Torres, Inventor Paul Dow, Applicants' Representative Gregory Sebald and George Michaels, Vice President of Engineering for Oxbo International, the Assignee of the present application. The Beougher et al. reference was discussed as well as claims that had been proposed. Proposed claims were discussed and it was agreed that at least proposed claim 9 would be allowable. It was further agreed that an official Amendment would be submitted by Applicants. Applicants and their Representative thank Examiner Torres for the cooperation and courtesy extended during the interview.

If a further interview may be helpful in this matter, Examiner Torres is invited to contact Applicants' representative at (612) 336-4728.

Please consider this a PETITION FOR EXTENSION OF TIME for a sufficient number of months to enter these papers or any future reply, if appropriate. Please charge any additional fees or credit overpayment to Deposit Account No. 13-2725.

23552
PATENT TRADEMARK

Respectfully submitted,

MERCHANT & GOULD P.C.

Dated: 9/26/11

By: _____
Gregory A. Sebald
Reg. No. 33,280
GAS/krn

Electronic Acknowledgement Receipt

EFS ID:	11051587
Application Number:	12925405
International Application Number:	
Confirmation Number:	1677
Title of Invention:	Windrow merging apparatus
First Named Inventor/Applicant Name:	Paul W. Dow
Customer Number:	23552
Filer:	Gregory A. Sebald/Karen Nejedly
Filer Authorized By:	Gregory A. Sebald
Attorney Docket Number:	12821.0016USC2
Receipt Date:	26-SEP-2011
Filing Date:	19-OCT-2010
Time Stamp:	17:02:26
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	Applicant summary of interview with examiner	16sum_20110926150820.pdf	46862 84ec0a3ca58074032a1f2b84be5f22fa14ab3c3b	no	1

Warnings:	
Information:	

2		16amd_20110926150833.pdf	106000 ea3e87500c2ece1c8b7ec2ed6121731b2a1410de	yes	5

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	3
Applicant Arguments/Remarks Made in an Amendment	4	5

Warnings:	
Information:	
Total Files Size (in bytes):	152862

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

Applicant:	BYRON et al.	Examiner:	Alicia M. Torres
Serial No.:	12/925,405	Group Art Unit:	3671
Filed:	October 19, 2010	Docket No.:	12821.0016USC2
Customer No.	23552	Confirmation No.	1677
Title:	WINDROW MERGING APPARATUS		

AMENDMENT

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

Dear Sir:

In response to the Office Action mailed June 24, 2011, please amend the above-referenced application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 4 of this paper.

Amendments to the Claims:

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

Listing of Claims:

1. (CANCELLED)

2. (NEW) A windrow merger apparatus configured for travel in a first direction, comprising:

a frame;

a first pickup assembly supported by the frame, the first pickup assembly including a first belt conveyor arranged to convey material in a direction transverse to the first direction of travel and driven by a first motor;

a second pickup assembly supported by the frame, the second pickup assembly including a second belt conveyor arranged to convey material in a direction transverse to the first direction of travel and driven by a second motor; and

a third pickup assembly supported by the frame, the third pickup assembly including a third belt conveyor arranged to convey material in a direction transverse to the first direction of travel and driven by a third motor;

wherein at least two of the pickup assemblies are foldable between an extended position and a retracted position, each of the first, second, and third pickup assemblies being aligned side

by side when each of the pickup assemblies is positioned in the extended position such that the first, second, and third pickup assemblies provide an unobstructed continuous line of material pickup;

each of the first, second and third belt conveyors being operable in either direction independently of the other belt conveyors.

Remarks:

Applicants have read and considered the Office Action dated June 24, 2011 and the references cited therein. Claim 1 has been cancelled without prejudice or disclaimer. New claim 2 has been added and is pending. Reconsideration is hereby requested.

Claim 1 was rejected under 35 U.S.C. § 102(b) as being anticipated by Beougher et al. Applicants have cancelled claim 1 without prejudice or disclaimer. Applicants assert that the rejection is therefore moot and requests that it be withdrawn.

New claim 2 has been presented and is believed to patentably distinguish over Beougher and any other prior art or combination thereof. The claim was discussed and agreed to be allowable during an Examiner Interview and Applicants assert that the claim patentably distinguishes over the prior art and is allowable.

Applicants assert that the application is in condition for allowance.

A speedy and favorable action in the form of a Notice of Allowance is hereby solicited. If the Examiner feels that a telephone interview may be helpful in this matter, please contact Applicants' representative at (612) 336-4728.

Please consider this a PETITION FOR EXTENSION OF TIME for a sufficient number of months to enter these papers or any future reply, if appropriate. Please charge any additional fees or credit overpayment to Deposit Account No. 13-2725.

Respectfully submitted,

MERCHANT & GOULD P.C.

Dated: 9/26/11

By: _____
Gregory A. Sebald
Reg. No. 33,280
GAS/krn

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
12/925,405	10/19/2010	

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	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			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 $250 ($125 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))							
			TOTAL			TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

AMENDMENT 09/26/2011

	(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 ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 1	Minus	** 20	= 0	X $30 =	0	OR	X $ =	
Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X $125 =	0	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	0	OR	TOTAL ADD'L FEE	

AMENDMENT

	(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 ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
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 number found in the appropriate box in column 1.

Legal Instrument Examiner:
/TRINA STEPTOE/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	DOW et al.	Examiner:	Alicia M. Torres
Serial No.:	12/925,405	Group Art Unit:	3671
Filed:	October 19, 2010	Docket No.:	12821.0016USC2
Customer No.	23552	Confirmation No.	1677
Title:	WINDROW MERGING APPARATUS		

INFORMATION DISCLOSURE STATEMENT (37 C.F.R. § 1.97(c))

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

Dear Sir:

With regard to the above-identified application, the items of information listed on the enclosed Form 1449 are brought to the attention of the Examiner.

This statement should be considered because it is submitted after the mailing date of a first Office Action on-the-merits or a first Office Action after filing a Request for Continued Examination under 37 C.F.R. § 1.114 or a CPA under 37 C.F.R. § 1.53(d), but before the mailing date of: i) a final action under 37 C.F.R. § 1.113; ii) a Notice of Allowance under 37 C.F.R. § 1.311; or iii) an action that otherwise closes prosecution on the application.

Payment is made by credit card in the amount of $180.00 for consideration of the items listed on the enclosed Form 1449.

In accordance with 37 C.F.R. §1.98(a)(2), a copy of each foreign patent and/or a copy of each publication, other than U.S. patents and U.S. patent application publications, listed on the accompanying Form 1449 is enclosed.

No representation is made that a reference is "prior art" within the meaning of 35 U.S.C. §§ 102 and 103 and Applicants reserve the right, pursuant to 37 C.F.R. § 1.131 or otherwise, to establish that the reference(s) are not "prior art." Moreover, Applicants do not represent that a reference has been thoroughly reviewed or that any relevance of any portion of a reference is intended.

Consideration of the items listed is respectfully requested. Pursuant to the provisions of M.P.E.P. 609, it is requested that the Examiner return a copy of the attached Form 1449, marked as being considered and initialed by the Examiner, to the undersigned with the next official communication.

Please consider this a PETITION FOR EXTENSION OF TIME for a sufficient number of months to enter these papers or any future reply, if appropriate. Please charge any additional fees or credit overpayment to Deposit Account No. 13-2725.

Respectfully submitted,

MERCHANT & GOULD P.C.

Dated: 9/27/11

By: _____
Gregory A. Sebald
Reg. No. 33,280
GAS/krn

Electronic Acknowledgement Receipt

EFS ID:	11062538
Application Number:	12925405
International Application Number:	
Confirmation Number:	1677
Title of Invention:	Windrow merging apparatus
First Named Inventor/Applicant Name:	Paul W. Dow
Customer Number:	23552
Filer:	Gregory A. Sebald/Karen Nejedly
Filer Authorized By:	Gregory A. Sebald
Attorney Docket Number:	12821.0016USC2
Receipt Date:	27-SEP-2011
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(54) Bezeichnung des Gegenstandes
Heuwerbungsmaschine

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H E U W E R B U N G S M A S C H I N E

Die Erfindung bezieht sich auf eine Heuwerbungsmaschine gemäß dem Oberbegriff des Anspruchs 1.

Bei einer bekannten Maschine dieser Art (DE-OS 30 00 820) sind die Zinkenträger über Kurbelarme in einer Steuerkurve geführt, deren Führungsflächen einander gegenüberliegen und einen zur Drehachse des Kreiselrechens der Heuwerbungsmaschine koaxialen Führungsspalt begrenzen, den an den Kurbelarmen gelagerte Rollen durchlaufen. Derartig ausgebildete Steuerkurven sind geometrisch nicht optimal ausgelegt. Dies führt dazu, daß im Kurvenbereich, in dem die Zinkenarme umgesteuert werden, von den Rollen mehr oder weniger große Axialkräfte übertragen werden müssen. Die Lebensdauer der Rollen kann dadurch beeinflußt werden.

Der Erfindung liegt die Aufgabe zugrunde, eine Heuwerbungsmaschine der im Oberbegriff des Anspruchs 1 angegebenen Art zu schaffen, die bei großer baulicher Einfachheit die Steuerung der Zinkenträger und damit die Arbeitsqualität der Kreiselrechen verbessert sowie die Lebensdauer der Maschine erhöht.

Die Erfindung löst diese Aufgabe durch eine Heuwerbungsmaschine mit den Merkmalen des Anspruchs 1. Hinsichtlich wesentlicher, weiterer Ausgestaltungen wird auf die Ansprüche 2 bis 13 verwiesen.

Die erfindungsgemäße Steuerkurve, in der die Laufrollen für die Kurbelarme geführt werden, ist geometrisch optimiert, indem die Erzeugenden der Laufflächen der Rollen und die Erzeugende einer gedachten Mittelfläche zwischen den Führungsflächen einen gemeinsamen Schnittpunkt auf der Drehachse des Kreiselrechens haben. Dadurch wird die Lebensdauer der Rollen wesentlich erhöht und der Kurvenverlauf kann ohne nachteilige Folgen den Erfordernissen den an den Zinkenarmen befestigten Zinken optimal angepaßt werden.

In dem gemeinsamen Schnittpunkt, der vorzugsweise in der Mitte des vertikalen Stellbereiches der Steuerkurve liegt, treffen sich neben der gedachten Mittelfläche auch die Mittelachsen der Rollen, die an gekröpften Kurbelarmen befestigt sind und die Mittelachsen der radial ausgerichteten Innenteile der Zinkenträger, so daß dieser gemeinsame Schnittpunkt einem Mittelpunkt einer Kugel gleicht, auf den hin sich alle beteiligten Achsen ausrichten.

Eine vorteilhafte Ausführungsform der Erfindung ist eine Ausbildung der Führungsflächen der Steuerkurve, wenn diese parallel zur gedachten Mittelfläche ausgerichtet sind. Hierdurch wird insbesondere die Herstellung vereinfacht, und zwar besonders dann, wenn die Führungsflächen beispielsweise nicht spanabhebend sondern durch Pressen oder Gießen hergestellt werden.

Die Rollen sind in vorteilhafter Weise mit balligen Laufflächen versehen, damit Fertigungstoleranzen ausgeglichen und dadurch die Herstellung vereinfacht wird.

Bei der Heuwerbungsmaschine nach der Erfindung weisen die einzelnen Kreiselrechen eine unterschiedliche Anzahl von Zinkenträger auf. Hierdurch wird der jeweiligen Schwadgröße Rechnung getragen, was insbesondere an den Übergabestellen zu einer problemlosen und schonenden Übergabe des Schwades führt. Hierbei hat vorzugsweise der in Fahrtrichtung erste Kreiselrechen am wenigsten Zinken und der letzte die meisten.

An den Übergabestellen überlappen sich die Zinkenkreisel, wobei in vorteilhafter Weise nach der Erfindung die abgekröpften Zinkenarme des vorlaufenden Kreisels über den jeweiligen Zinkenträger des nachgeordneten Kreiselrechens so gesteuert wird, daß er über ihn hinweggehoben wird und diesen nicht behindert. Dies wird durch die erfindungsgemäß geometrisch optimierte Steuerkurve erleichtert, da auch steilere Kurvenbahnen sich nicht nachteilig auswirken.

Zum Straßentransport werden die äußeren Kreiselrechen vorzugsweise um etwa fahrtrichtungsparallele Achsen in eine mindestens senkrechte Lage geklappt und verriegelt. Der sich unter dem Maschinengestell befindende Kreiselrechen kann beispielsweise hydraulisch gegenüber diesem in eine Transportstellung angehoben werden. Dadurch erhält dieser Kreiselrechen eine ausreichende Transporthöhe. Die Laufräder am Maschinengestell sind durch eine Lenkvorrichtung steuerbar, die automatisch wirkt und bei Kurvenfahrt einen optimalen Nachlauf der Heuwerbungsmaschine sicherstellt.

Weitere Vorteile der Erfindung ergeben sich aus der nachfolgenden Beschreibung und den Zeichnungen, in denen ein Ausführungsbeispiel nach der Erfindung schematisch, angenähert maßstäblich dargestellt ist. Es zeigt:

Fig. 1 - Einen Schwader mit drei Kreiselrechen, vereinfacht dargestellt, in Arbeitsstellung, in einer Seiten-

ansicht.

Fig. 2 - Eine Draufsicht des Schwaders.

Fig. 3 - Eine Ansicht des Schwaders in Fahrtrichtung, in Arbeitsstellung, in vereinfachter Darstellung.

Fig. 4 - Eine Ansicht des Schwaders in Fahrtrichtung, in Transportstellung, in vereinfachter Darstellung.

Fig. 5 - Eine vereinfachte Draufsicht der Steuerkurve mit den zugeordneten Zinkenträgern.

Fig. 6 - Einen Schnitt A-A gemäß Fig. 5.

Fig. 7 - Einen Schnitt A-A gemäß Fig. 5 mit einer Ausführungsvariante.

Der als Ausführungsbeispiel in den Zeichnungen dargestellte Schwader ist vorzugsweise über bildlich vernachlässigte Unterlenker eines Dreipunktgestänges mit einem ebenfalls nicht dargestellten Traktor verbunden und wird von diesem in Fahrtrichtung (F) gezogen. Die Kreiselrechen (16,17,18) werden in Arbeitsstellung über die Traktorzapfwelle, Gelenkwellen und Getriebe angetrieben. Der Schwader besteht im wesentlichen aus einem Maschinengestell (1), das an seinem hinteren Ende vorzugsweise zwei Laufräder (3) aufweist, die über eine Lenkvorrichtung (28) automatisch von der jeweiligen Kurvenfahrt des Traktors abhängig gesteuert werden, und drei Kreiselrechen (16,17,18), deren Verbindungsachse (30) zur Fahrtrichtung einen spitzen Winkel (ß) einschließt. Je nach gewünschter Arbeitsbreite des Schwaders können auch mehrere oder weniger Kreiselrechen dem Maschinengestell (1) zugeordnet werden.

Der Schwader kann auch als Dreipunktgerät und/oder ohne Laufräder (3) ausgerüstet werden. Die einzelnen Kreiselrechen (16,17,18) sind in Arbeitsstellung begrenzt höhenbeweglich und stützen sich über Laufräder (29) auf dem Boden ab, damit sich die Arbeitswerkzeuge den Bodenunebenheiten optimal anpassen können.

Die Kreiselrechen (16,17,18) weisen eine unterschiedliche Anzahl abgekröpfter Zinkenträger (4) auf, an denen jeweils Zinken (2) als Arbeitswerkzeuge befestigt sind. Ein in Fahrtrichtung (F) erster Kreiselrechen (16) hat die wenigsten Zinkenträger, deren Anzahl bis zu einem letzten Kreiselrechen (18) zunimmt. Ferner sind die Kreiselrechen (16,17,18) überlappend angeordnet. Die Zinkenträger (4) der jeweils vorauslaufenden Kreiselrechen (16,17) werden im Bereich der Überlappung über die dem nachfolgenden Kreiselrechen (17,18) zugeordneten Zinkenträger (4) hinweggehoben. Dies wird durch eine entsprechende Auslegung der jeweiligen Steuerkurve (21,22) erreicht.

Durch die Überlappung und die unterschiedliche Anzahl der wirksamen Zinkenarme (4) der Kreiselrechen (16,17,18) wird entsprechend dem Kreiselrechendurchmesser einmal eine relativ schmale Maschine erreicht und zum anderen der Übergabepunkt des Halmgutes zum nächsten Kreiselrechen möglichst weit in Fahrrichtung nach vorn verlegt. Dies kommt der schonenden Behandlung des Halmgutes und der Anpassung an die der Arbeitsbreite entsprechende, zunehmende Schwadgröße zugute.

Je nach Einsatzbereich kann der Schwader auch so ausgestaltet sein, daß die äußeren Kreiselrechen (16,18) bei der Arbeit soweit auseinandergezogen und verriegelt werden können, daß Kleinschwaden mit der Arbeitsbreite entsprechend den Kreiselrechendurchmessern und deren Achsabstand gebildet werden.

Es ist auch möglich, den Schwader, ohne die äußeren Kreiselrechen (16,18) hochzuklappen, für den Transport in die Längsachse hinter den Traktor zu schwenken und zu arretieren. Wegen des relativ kurzen Schwerpunktabstandes zur Koppelebene wirken sich hier die sich überlappenden Kreiselrechen besonders günstig aus.

Die Fig. 1,2 und 3 zeigen den Schwader jeweils in Arbeitsstellung.

In der Transportstellung (Fig. 4) werden die äußeren Kreiselrechen (16,18) jeweils etwa um mindestens 90° über fahrtrichtungsparallele Achsen (27) geschwenkt und verriegelt. Der mittlere Kreiselrechen (17) wird nach dem Ausführungsbeispiel um eine Querachse (31) beispielsweise hydraulisch unter das Maschinengestell (1) geschwenkt, so daß der Schwader als aufgesatteltes Gerät mit über die Lenkvorrichtung (28) automatisch gesteuerten Laufräder (3) im Transport gefahren werden kann.

In Figur 5 ist die Steuerkurve (21,22), die jedem Kreiselrechen (16,17,18) zugeordnet ist, schematisch dargestellt. Die Steuerkurve ist in bekannter Weise radial ein- und feststellbar, damit die Kurvenstellung und damit die Stellung der Zinkenträger (4) und der Zinken (2) den Erfordernissen angepaßt werden kann.

In der Steuerkurve (21,22) werden die Rollen (7,8) vertikal geführt. Sie sind über gekröpfte Kurbelarme (23) mit dem drehbaren Zinkenträger (4) verbunden, an dessen anderem Ende die Zinken (2) befestigt sind. Die Steuerkurve (21,22) steuert also durch ihre Auslegung das Arbeitswerkzeug Zinken(2).

Die Mittelachsen (25,26) der Rollen (7,8) und des Innenteils (24) treffen sich jeweils in einem gemeinsamen Schnittpunkt (12) auf den jeweiligen vertikalen Dreh-

achsen (13,14,15) der einzelnen Kreiselrechen (16,17,18). Wie aus Fig. 6 und Fig. 7 zu sehen ist, liegt der Schnittpunkt (12) vorzugsweise in der Mitte des vertikalen Stellbereiches der Steuerkurven (21,22).

Fig. 6 veranschaulicht schematisch eine Ausführung mit konischen Laufflächen (6) der Rollen (7). Die ebenfalls konischen Führungsflächen (9) der Steuerkurve (21) weisen mit ihren Erzeugenden (19) auf den gemeinsamen Schnittpunkt (12).

Die gedachte Mittelfläche (20) entspricht der Mittelebene der Steuerkurve (21), ist der Kurvenform angepaßt und schneidet den Schnittpunkt (12) in der jeweiligen Drehachse (13,14,15). Die Mittelachse (25) der Steuerkurve (21) und eine Erzeugende (19) schließt einen spitzen Winkel (α) ein.

Zwischen der konischen Lauffläche (6) der Rolle (7) und der konischen Führungsfläche (9) ist ausreichendes Spiel vorgesehen, wobei die am Außendurchmesser konische Rolle (7) vorzugsweise ballig ausgeführt wird, damit beispielsweise Fertigungstoleranzen aufgenommen werden können.

In Fig. 7 ist eine Variante des Ausführungsbeispiels schematisch dargestellt. Die Lauffläche (5) der Rolle (8) sowie die korrespondierende Führungsfläche (10) der Steuerkurve (22) ist zylindrisch ausgeführt. Diese Flächen sind jeweils parallel zur Mittelachse (25) der Rolle (8) ausgerichtet, die den Schnittpunkt (12) schneidet. Die gedachte Mittelfläche (20) entspricht auch hier der Mittelebene der Steuerkurve (22).

Zur besseren Veranschaulichung kann als Vergleich ein zylindrischer Fräser herangezogen werden, dessen Mittelachse auf

den Schnittpunkt (12) ausgerichtet ist und die jeweilige Kurvenform der Steuerkurve (22) einfräst. Die Mittelachse (25) ist während des gesamten Fräsvorganges der koaxial zur jeweiligen Drehachse (13,14,15) ausgerichteten Steuerkurve (22) zum Schnittpunkt (12) hin ausgerichtet.

Zum Ausgleich von Fertigungstoleranzen ist hier ebenfalls Spiel zwischen der vorzugsweise balligen Lauffläche (5) der Rolle (8) und der Führungsfläche (10) vorgesehen.

Eine derartig zylindrisch ausgeführte Führungsfläche (10) vereinfacht beispielsweise die Fertigung von gepreßten oder gegossenen Ausführungformen.

Die in den Ausführungsbeispielen aufgezeigte, vorteilhafte Ausbildung der Steuerkurven (21,22) ist nicht auf die dargestellten Ausführungsformen beschränkt, sondern kann überall dort angewendet werden, wo bei Heuwerbungs- oder anderen Maschinen die dadurch erreichte, vorteilhafte Arbeit der Werkzeuge von Vorteil ist.

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A n s p r ü c h e

1. Heuwerbungsmaschine zum Schwaden von Halmgut mit mindestens einem um eine aufrechte Drehachse umlaufend angetriebenen Kreiselrechen, der über ein Maschinengestell (1) mit dem Traktor verbunden ist, wobei sich das Maschinengestell (1) über Laufräder (3) auf dem Boden abstützt und bei dem die Zinkenträger (4) über Kurbelarme in einer Steuerkurve geführt sind, deren Führungsflächen einander gegenüberliegen und einen zur Drehachse des Kreiselrechens koaxialen Führungsspalt begrenzen, den an Kurbelarmen gelagerte Rollen durchlaufen, dadurch gekennzeichnet, daß die Laufflächen (6) der Rollen (7) und die Erzeugende (19) einer gedachten Mittelfläche (20) zwischen den Führungsflächen (9) einen gemeinsamen Schnittpunkt (12) auf der Drehachse (13,14,15) des Kreiselrechens (16,17,18) haben.

2. Heuwerbungsmaschine nach Anspruch 1, dadurch gekennzeichnet, daß die Führungsflächen (10) der Steuerkurve (22) parallel zur gedachten Mittelfläche (20) ausgerichtet sind.

3. Heuwerbungsmaschine nach Anspruch 1, dadurch gekennzeichnet, daß die Führungsflächen (9) der Steuer-

kurve (21) zur gedachten Mittelfläche (20) unter einem sich radial nach außen hin öffnenden kleinen, spitzen Winkel (α) verlaufen.

4. Heuwerbungsmaschine nach Anspruch 3, dadurch gekennzeichnet, daß die Erzeugenden (19) der Führungsflächen (9) der Steuerkurve (21) sich in einem gemeinsamen Schnittpunkt (12) auf der Drehachse (13,14,15) des Kreiselrechens (16,17,18) treffen.

5. Heuwerbungsmaschine nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß der gemeinsame Schnittpunkt (12) in der Mitte des vertikalen Stellbereichs der Steuerkurve (21,22) liegt.

6. Heuwerbungsmaschine nach einem der Ansprüche 1 bis 5, dadurch gekennzeichnet, daß die Zinkenträger (4) abgekröpfte Kurbelarme (23) und radial ausgerichtete Innenteile (24) aufweisen, deren Mittelachsen (25,26) den gemeinsamen Schnittpunkt (12) auf der Drehachse (13,14,15) des Kreiselrechens (16,17,18) ebenfalls treffen.

7. Heuwerbungmsmaschine nach einem der Ansprüche 1 bis 6, dadurch gekennzeichnet, daß die Rollen (7,8) eine ballige Lauffläche aufweisen.

8. Heuwerbungmaschine nach einem der Ansprüche 1 bis 7, mit mehreren einander benachbarten Kreiselrechen (16,17,18), deren Drehachsen (13,14,15) in einer gemeinsamen, gedachten Ebene verlaufen, die mit der Fahrtrichtungsebene (F) einen von 90° abweichenden Winkel einschließt, dadurch gekennzeichnet, daß jeder Kreiselrechen (16,17,18) eine unterschiedliche Anzahl von Zinkenträgern (4) aufweist.

9. Heuwerbungsmaschine nach Anspruch 8, dadurch gekennzeichnet, daß die Anzahl der Zinkenträger (4) pro Krei-

selrechen (16,17,18) in Fahrtrichtung (F) vom ersten (16) zum letzten Kreiselrechen (18) zunimmt.

10. Heuwerbungsmaschine nach einem der Ansprüche 8 oder 9, dadurch gekennzeichnet, daß die äußeren Kreiselrechen (16,18) um etwa fahrtrichtungsparallele Achsen (27) in eine mindestens senkrechte Lage hochklappbar und verriegelbar sind.

11. Heuwerbungsmaschine nach einem der Ansprüche 8 bis 10, dadurch gekennzeichnet, daß der unter dem Maschinengestell (1) befindliche Kreiselrechen (17) gegenüber diesem in eine Transportstellung anhebbar ist.

12. Heuwerbungsmaschine nach Anspruch 11, dadurch gekennzeichnet, daß die Laufräder (3) durch eine Lenkvorrichtung (28) lenkbar sind.

13. Heuwerbungsmaschine nach einem der Ansprüche 8 bis 12, dadurch gekennzeichnet, daß die Zinkenträger (4) benachbarter Kreiselrechen (16,17,18) einander überlappende Arbeitsbereiche aufweisen.

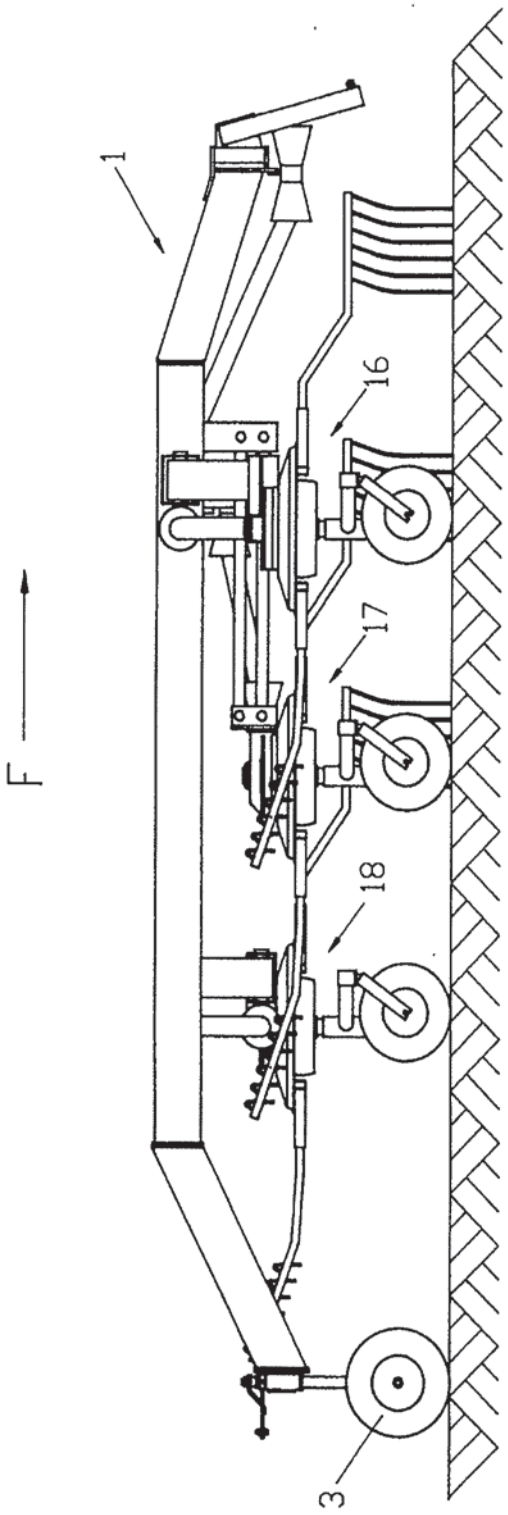

Fig.1

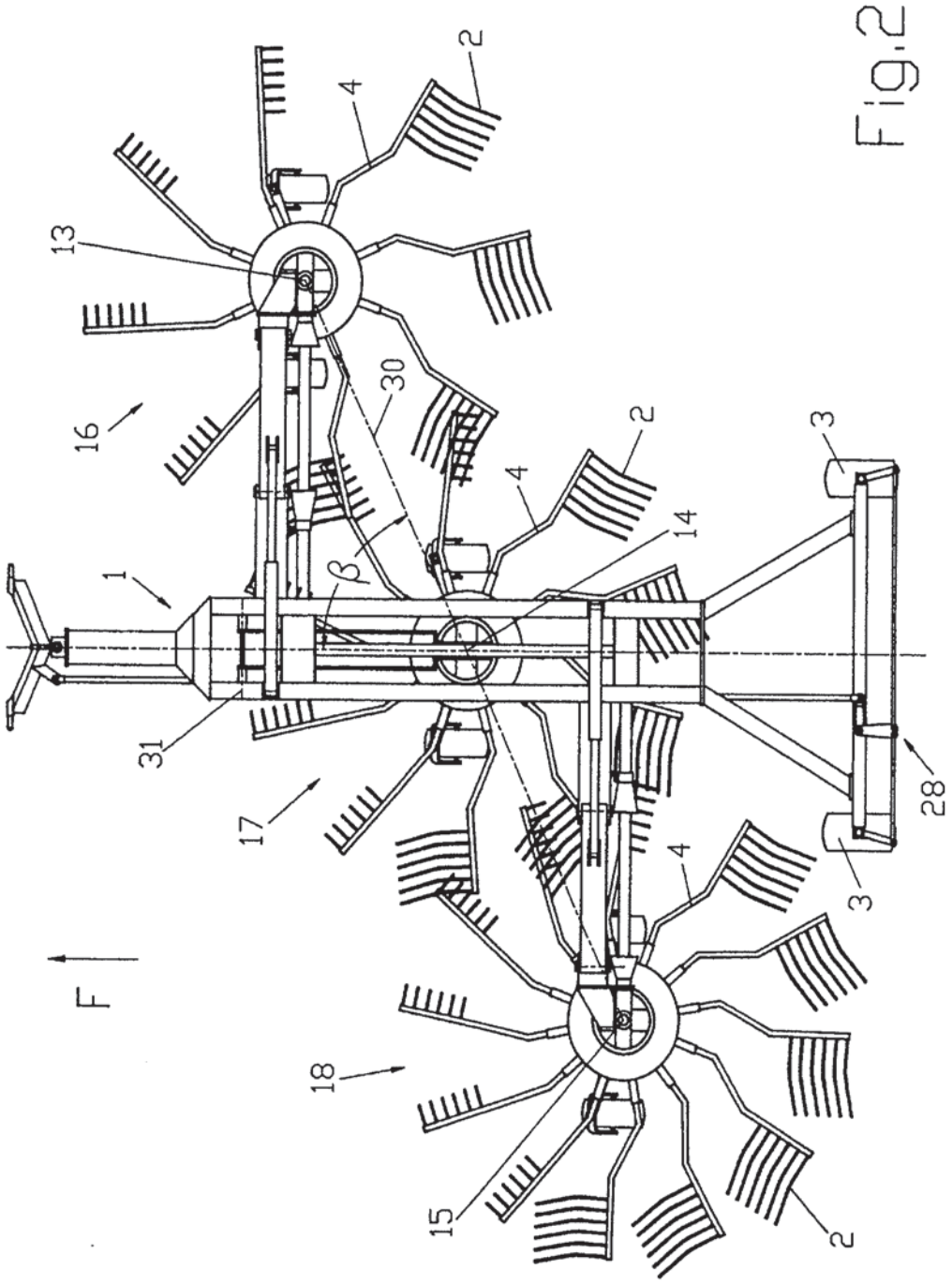

Fig.2

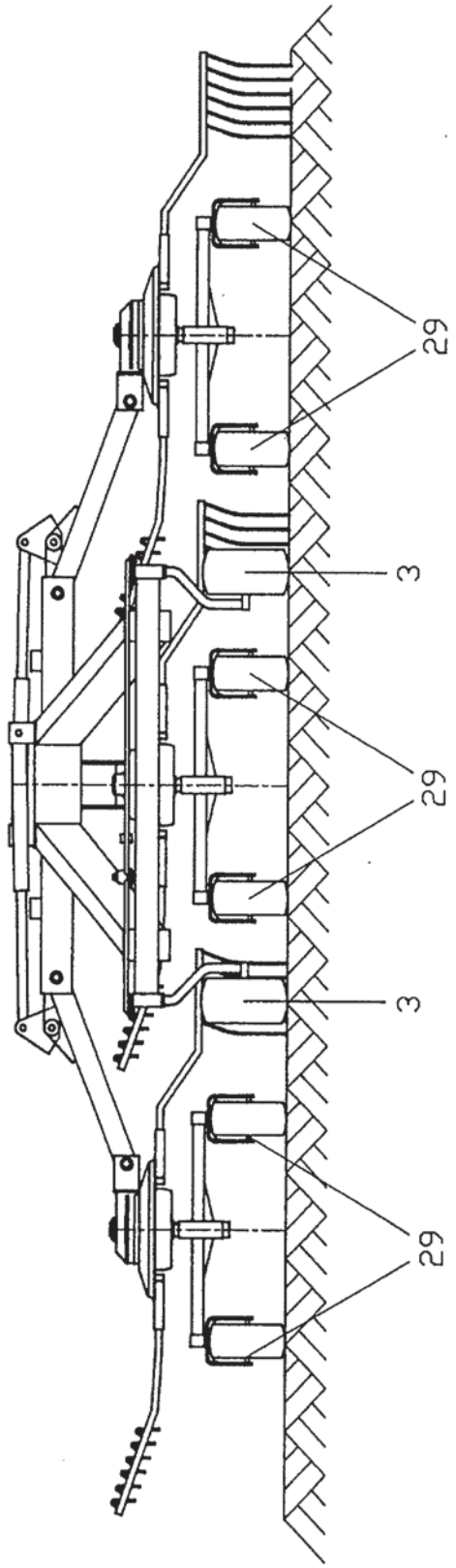

Fig.3

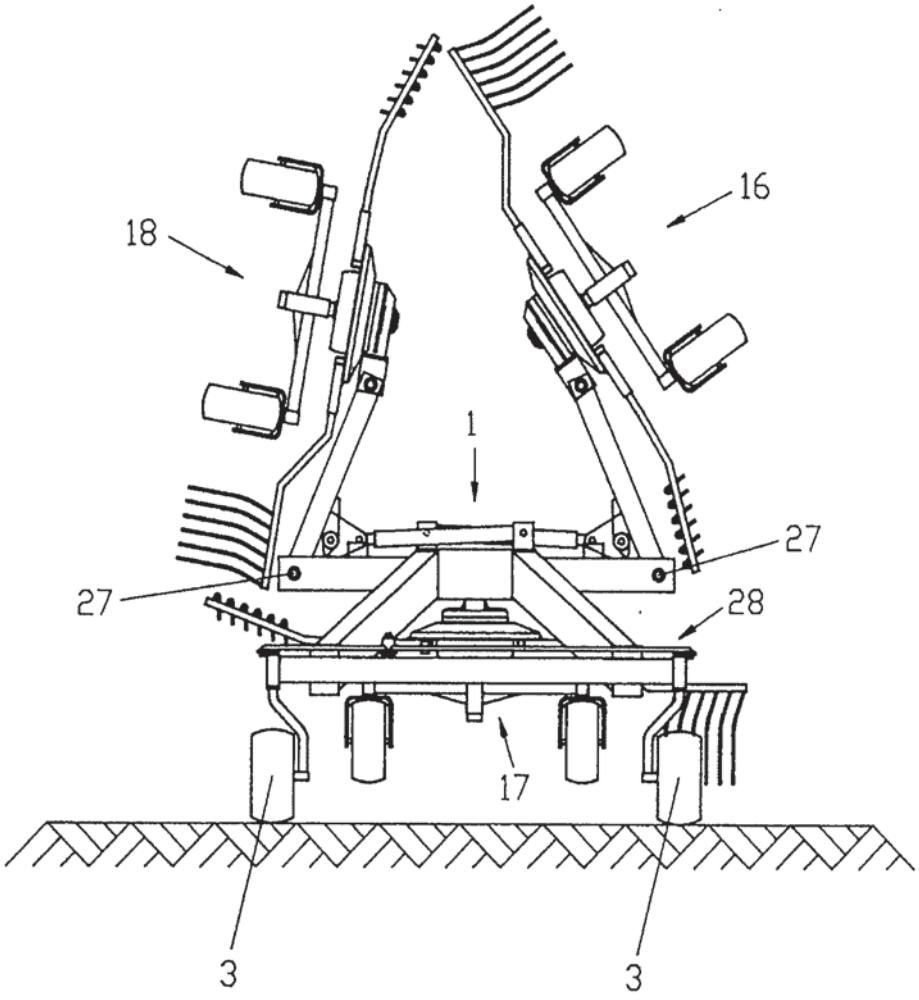

Fig.4

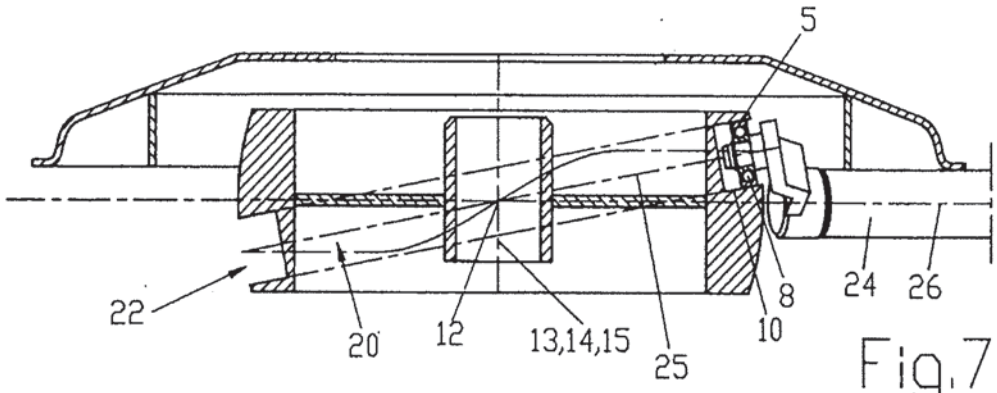

Fig.7

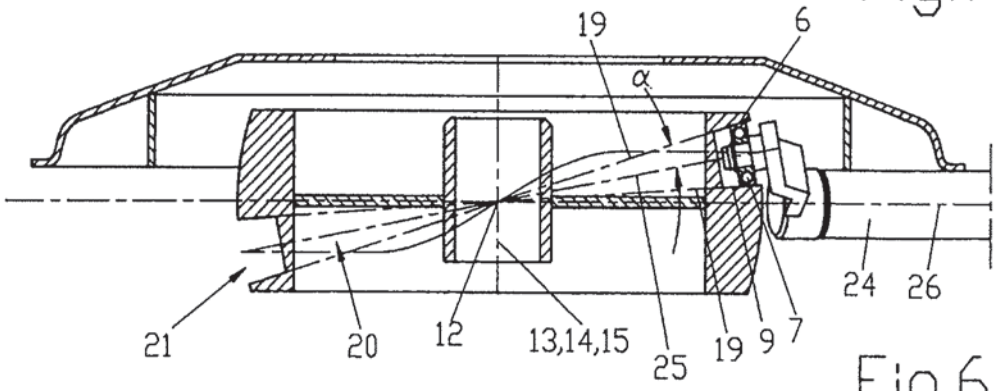

Fig.6

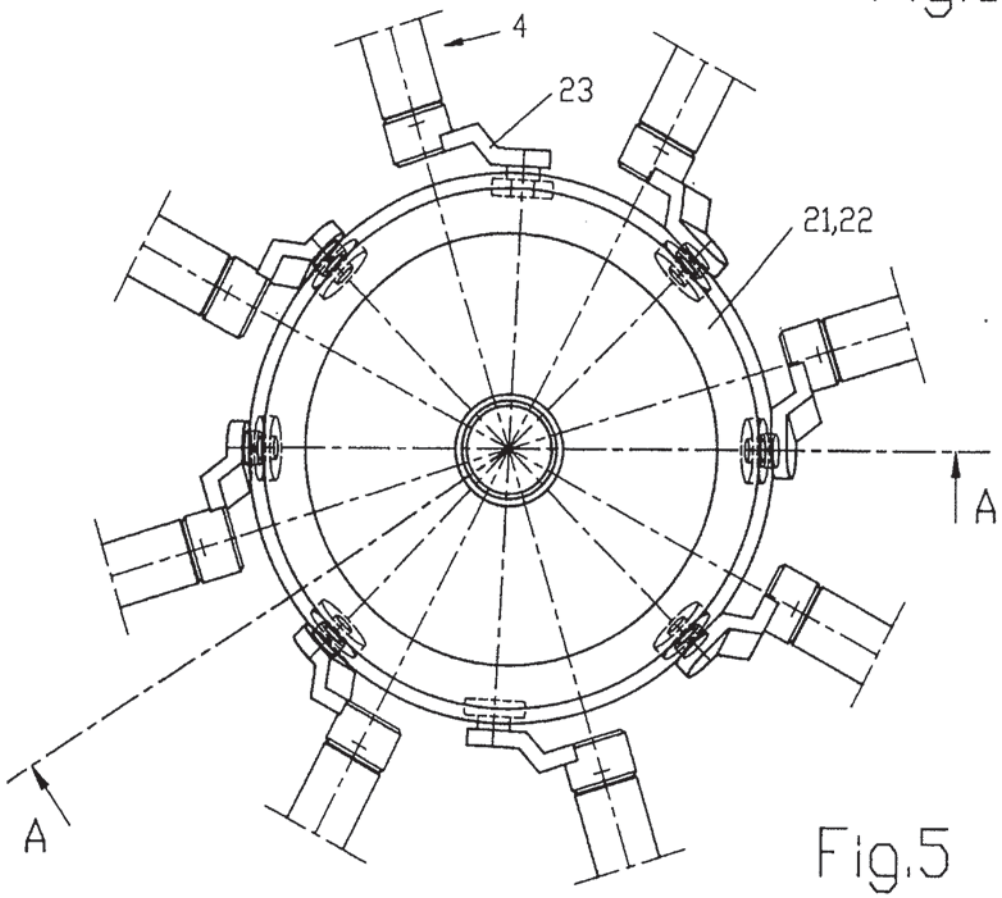

Fig.5

(19) Federal Republic of Germany

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HAY-MAKING MACHINE

The invention relates to a hay-making machine according to the preamble of claim 1.

In one known machine of this kind (DE-OS 30 00 820), the tine holders are led along crank arms in a control cam, whose guiding surfaces lie opposite each other and delimit a guide gap coaxial to the axis of rotation of the rotary rake of the hay-making machine, through which move rollers mounted on the crank arms. Such configured control cams are not designed with optimal geometry. This means that the rollers have to withstand rather large axial forces in the cam region where the tine arms change direction. This can affect the lifetime of the rollers.

The invention is based on the problem of creating a hay-making machine of the kind indicated in the preamble of claim 1, which with great structural simplicity improves the control of the tine holders and thus the working quality of the rotary rake, and also increases the lifetime of the machine.

The invention solves this problem by a hay-making machine with the features of claim 1. One will refer to claims 2 to 13 for other important modifications.

The control cam of the invention, in which the rollers for the crank arms are guided, is geometrically optimized in that the generatrices of the running surfaces of the rollers and the generatrix of an imaginary middle surface between the guide surfaces have a common point of intersection on the axis of rotation of the rotary rake. This substantially increases the lifetime of the rollers and the trend of the cam can be optimally adapted to the requirements of the tines fastened to the tine arms without harmful consequences.

At the common point of intersection, which preferably lies at the center of the vertical adjustment range of the control cam, there come together the imaginary middle surface, as well as the center axes of the rollers, which are fastened to bent crank arms, and the center axes of the radially oriented inner parts of the tine holders, so that this common point of intersection resembles a midpoint of a circle, toward which all involved axes are oriented.

One advantageous embodiment of the invention is a modification of the guiding surfaces of the control cam, when these are oriented parallel to the imaginary middle surface. This, in particular, simplifies the manufacture, especially when the guiding surfaces are made, for example, not by machine cutting, but by pressing or casting.

The rollers are advantageously provided with cambered running surfaces, so that manufacturing tolerances are balanced out, thereby simplifying the manufacture.

In the hay-making machine of the invention, the individual rotary rakes have a different number of tine holders. In this way, allowance is made for the particular size of the swath, which leads in particular to a problem-free and gentle transfer of the swath at the transfer points. Preferably the first rotary rake in the direction of travel has the fewest tines and the last rake has the most.

At the transfer points, the tine harrows overlap each other, and in preferable manner according to the invention the bent tine arms of the front harrow are guided above the tine holder of the rotary rake behind it so that it is lifted above it and does not hinder it. This is facilitated by the geometrically optimized control cam of the invention, since even steeper cam movement does not have a detrimental effect.

For road transport, the outer rotary rakes are folded up, preferably about axes roughly parallel to the direction of travel, into an at least vertical position and locked. The rotary rake located underneath the machine frame can be raised hydraulically, for example, into a transport position relative to it. In this way, this rotary rake is given a sufficient transport height. The running wheels on the machine frame can be controlled by a steering device, which works automatically and ensures an optimal curve following of the hay-making machine.

Further benefits of the invention will emerge from the following description and the drawings, in which an exemplary embodiment of the invention is depicted schematically, roughly to scale. There is shown:

Fig. 1 - A swather with three rotary rakes, in simplified representation, in the working position, in a side view.

Fig. 2 - A top view of the swather.

Fig. 3 - A front view of the swather in the direction of travel, in the working position, shown simplified.

Fig. 4 - A front view of the swather in the direction of travel, in transport position, shown simplified.

Fig. 5 - A simplified top view of the control cam with its tine holders.

Fig. 6 - A cross section A-A per Fig. 5.

Fig. 7 - A cross section A-A per Fig. 5 with a variant embodiment.

The swather shown as exemplary embodiment in the drawings is connected preferably by tow bars of a three-point linkage, omitted from the drawing, to a tractor, also not shown, and is pulled by the latter in the direction of travel (F). The rotary rakes (16, 17, 18) are driven into the working position via the tractor stub shaft, cardan shafts and gearing. The swather basically consists of a machine frame (1), having preferably two running wheels (3) at its rear end, which are controlled by a steering device (28) automatically depending on the particular curved travel of the tractor, and three rotary rakes (16, 17, 18), whose axis of connection (30) subtends an acute angle (ß) with the direction of travel. Depending on the desired working width of the swather, more or fewer rotary rakes can be coordinated with the machine frame (1).

The swather can also be outfitted as a three-point device and/or without running wheels (3). The individual rotary rakes (16, 17, 18) have limited height adjustment in the working position and are propped against the ground by running wheels (29), so that the working tools can be optimally adapted to ground irregularities.

The rotary rakes (16, 17, 18) have a different number of bent tine holders (4), to each of which tines (2) are fastened as the working tools. A first rotary rake (16) in the direction of travel (F) has the fewest tine holders, the number of which increases up to a last rotary rake (18). Moreover, the rotary rakes (16, 17, 18) are arranged to overlap. The tine holders (4) of the rotary rakes (16, 17) in front are lifted away from the tine holders (4) belonging to the rotary rakes (17, 18) behind them in the region of the overlapping. This is accomplished by an appropriate design of the respective control cam (21, 22).

Thanks to the overlapping and the different number of active tine arms (4) of the rotary rakes (16, 17, 18), one achieves on the one hand a relatively narrow machine, depending on the diameter of the rotary rakes, and on the other hand the point of transfer of the hay to the next rotary rake is moved forward as much as possible in the direction of travel. This helps with the gentle handling of the hay and the adapting to the swath size, which increases with the working width.

Depending on the area of application, the swather can also be configured so that the outer rotary rakes (16, 18) can be moved so far apart and locked during operation that small swaths can be formed with working width corresponding to the diameters of the rotary rakes and their axial spacing.

It is also possible to swivel the swather into the longitudinal axis behind the tractor and lock it for transport without folding up the outer rotary rakes (16, 18). Owing to the relatively short distance of the center of gravity from the plane of connection, the overlapping rotary rakes have an especially favorable effect here.

Figures 1, 2 and 3 show the swather in its working position.

In the transport position (Fig. 4), the outer rotary rakes (16, 18) are each swiveled by at least 90° about axes (27) which are parallel to the direction of travel and locked. The middle rotary rake (17) according to the exemplary embodiment is swiveled about a transverse axis (31), for example, by hydraulics, underneath the machine frame (1), so that the swather can be driven in transport as a semitrailer device with running wheels (3) automatically controlled via the steering device (28).

Figure 5 shows schematically the control cam (21, 22) coordinated with each rotary rake (16, 17, 18). In familiar fashion, the control cam can be radially adjusted and locked, so that the cam position and thus the position of the tine holder (4) and the tines (2) can be adapted to the requirements.

The rollers (7, 8) are vertically guided in the control cam (21, 22). They are connected by bent crank arms (23) to the rotary tine holder (4), at whose other end the tines (2) are fastened. The control cam (21, 22) thus controls, by its design, the working tool, or the tines (2).

The center axes (25, 26) of the rollers (7, 8) and the inner part (24) meet at a common point of intersection (12) on the respective vertical axes of rotation (13, 14, 15) of the

individual rotary rakes (16, 17, 18). As can be seen from Fig. 6 and 7, the point of intersection (12) preferably lies at the center of the vertical adjustment range of the control cams (21, 22).

Figure 6 shows schematically a design with conical running surfaces (6) of the rollers (7). The likewise conical guide surfaces (9) of the control cam (21) point by their generatrix (19) at the common point of intersection (12).

The imaginary middle surface (20) corresponds to the midplane of the control cam (21), is adapted to the shape of the cam, and crosses the point of intersection (12) at the particular axis of rotation (13, 14, 15). The center axis (25) of the control cam (21) and a generatrix (19) subtend an acute angle (α).

Between the conical running surface (6) of the roller (7) and the conical guide surface (9) there is provided sufficient play, and the roller (7), being conical at its outer diameter, is preferably cambered so that, for example, manufacturing tolerances can be provided for.

Figure 7 shows schematically a variant of the exemplary embodiment. The running surface (5) of the roller (8), as well as the corresponding guide surface (10) of the control cam (22), is cylindrical in shape. These surfaces are each parallel to the center axis (25) of the roller (8) that cuts the point of intersection (12). The imaginary middle surface (20), here as well, corresponds to the midplane of the control cam (22).

For better comprehension, one can use a cylindrical milling cutter for comparison, whose center axis is oriented to the point of intersection (12), and which mills the respective cam shape of the control cam (22). During the entire milling process of the control cam

(22) oriented coaxially to the respective axis of rotation (13, 14, 15), the center axis (25) is oriented to the point of intersection (12).

Here as well, play is present between the preferably cambered running surface (5) of the roller (8) and the guide surface (10), in order to equalize manufacturing tolerances.

Such a cylindrically shaped guide surface (10) simplifies the manufacture of pressed or mold-cast designs, for example.

The preferred configuration of the control cams (21, 22) shown in the exemplary embodiments is not limited to the depicted embodiments, but can be applied wherever the advantageous working of the tools thus accomplished is of benefit in hay-making or other machines.

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Claims

1. Hay-making machine for mowing swaths of hay with at least one rotary rake driven in rotation about an upright axis of rotation, which is connected via a machine frame (1) to the tractor, wherein the machine frame (1) is propped against the ground by running wheels (3) and wherein the tine holders (4) are led along crank arms in a control cam, whose guiding surfaces lie opposite each other and delimit a guidance gap coaxial to the axis of rotation of the rotary rake of the hay-making machine, through which move rollers mounted on the crank arms, characterized in that the running surfaces (6) of the rollers (7) and the generatrix (19) of an imaginary middle surface (20) between the guide surfaces (9) have a common point of intersection (12) on the axis of rotation (13, 14, 15) of the rotary rake (16, 17, 18).

2. Hay-making machine according to claim 1, characterized in that the guide surfaces (10) of the control cam (22) are oriented parallel to the imaginary middle surface (20).

3. Hay-making machine according to claim 1, characterized in that the guide surfaces (9) of the control cam (21) run at a small, acute angle (α) opening radially outward with respect to the imaginary middle surface (20).

4. Hay-making machine according to claim 3, characterized in that the generatrices (19) of the guide surfaces (9) of the control cam (21) meet at a common point of intersection (12) on the axis of rotation (13, 14, 15) of the rotary rake (16, 17, 18).

5. Hay-making machine according to one of claims 1 to 4, characterized in that the common point of intersection (12) lies at the center of the vertical adjustment range of the control cam (21, 22).

6. Hay-making machine according to one of claims 1 to 5, characterized in that the tine holders (4) have bent crank arms (23) and radially oriented inner parts (24), whose center axes (25, 26) likewise meet the common point of intersection (12) on the axis of rotation (13, 14, 15) of the rotary rake (16, 17, 18).

7. Hay-making machine according to one of claims 1 to 6, characterized in that the rollers (7, 8) have a cambered running surface.

8. Hay-making machine according to one of claims 1 to 7, with several rotary rakes (16, 17, 18) neighboring each other, whose axes of rotation (13, 14, 15) run in an imaginary common plane that subtends an angle other than 90° with the plane of the direction of travel (F), characterized in that each rotary rake (16, 17, 18) has a differing number of tine holders (4).

9. Hay-making machine according to claim 8, characterized in that the number of tine holders (4) per rotary rake (16, 17, 18) increases from the first (16) to the last rotary rake (18) in the direction of travel (F).

10. Hay-making machine according to one of claims 8 or 9, characterized in that the outer rotary rakes (16, 18) can be folded up about axes (27) roughly parallel to the direction of travel into an at least vertical position and locked.

11. Hay-making machine according to one of claims 8 to 10, characterized in that the rotary rake (17) located underneath the machine frame (1) can be raised into a transport position relative to it.

12. Hay-making machine according to claim 11, characterized in that the running wheels (3) can be controlled by a steering device (28).

13. Hay-making machine according to one of claims 8 to 12, characterized in that the tine holders (4) of neighboring rotary rakes (16, 17, 18) have overlapping working zones.

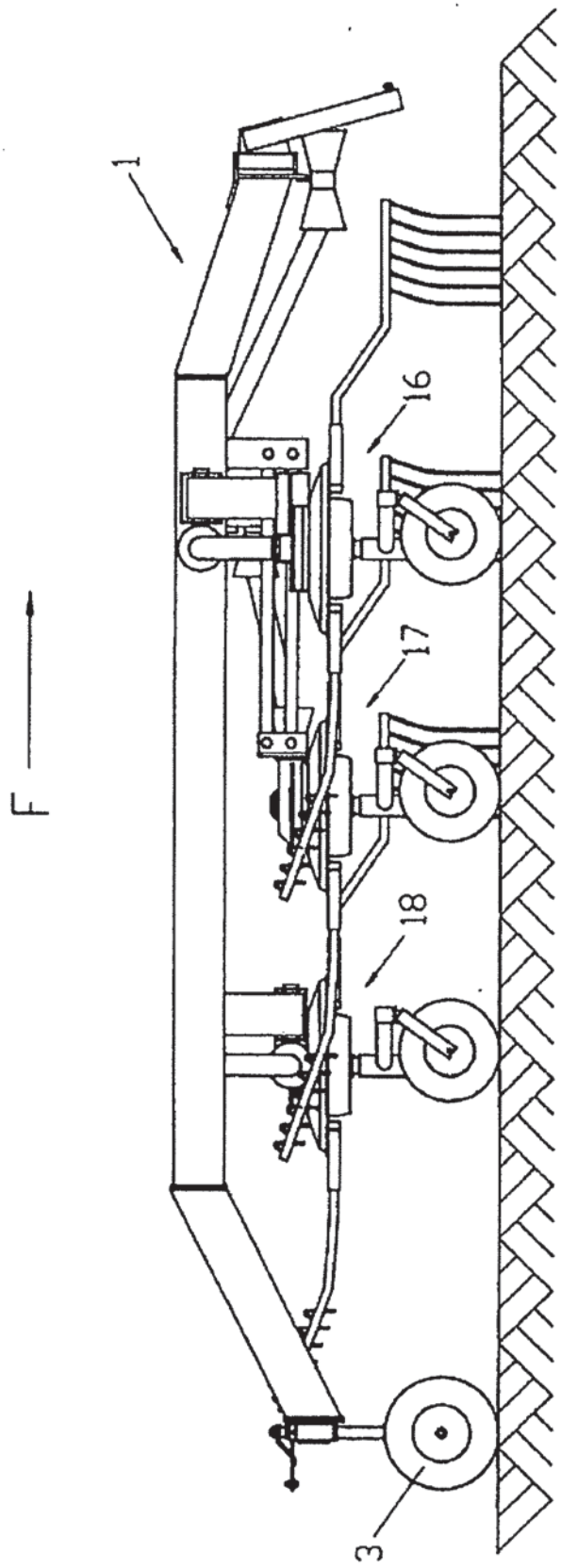

Fig.1

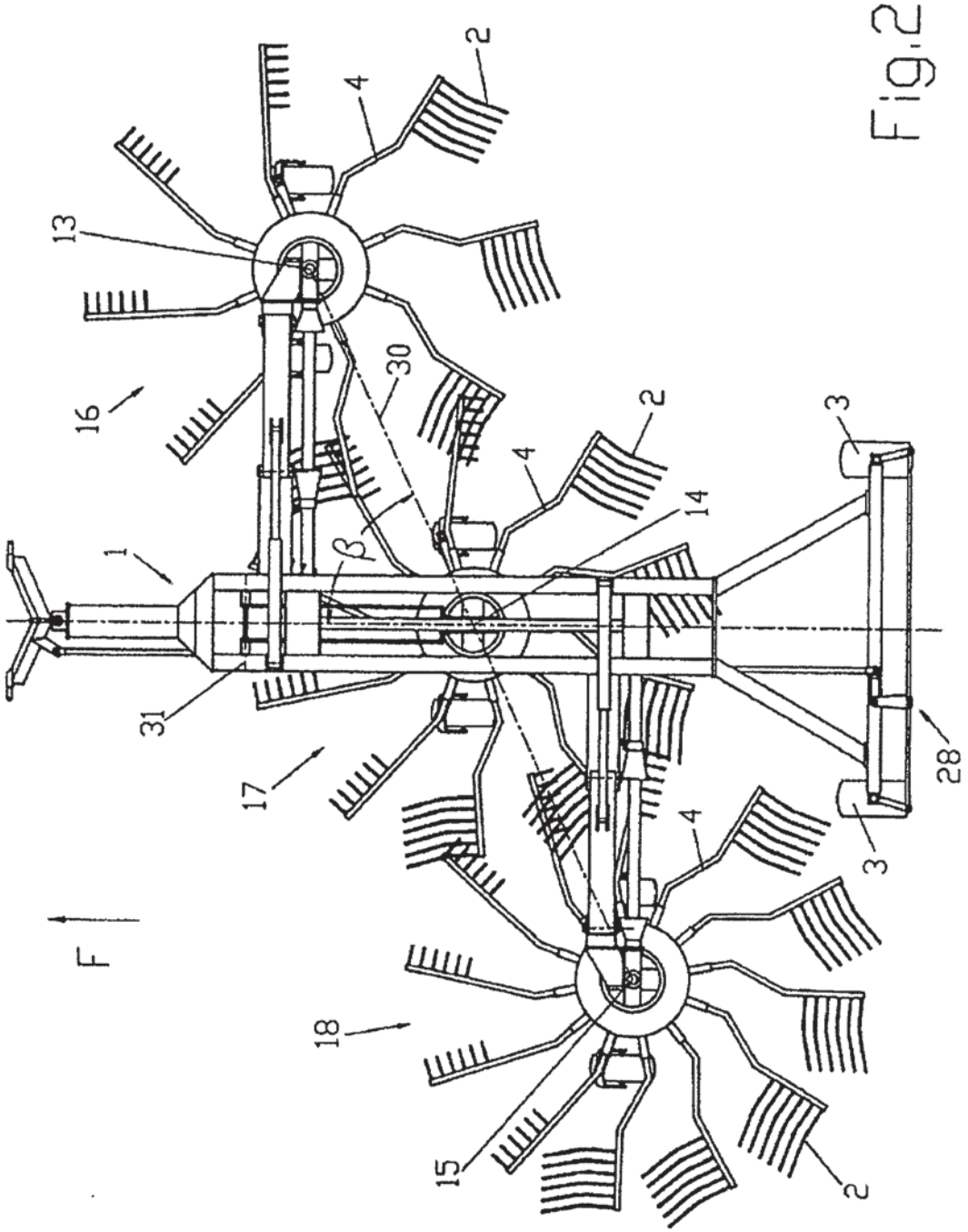

Fig.2

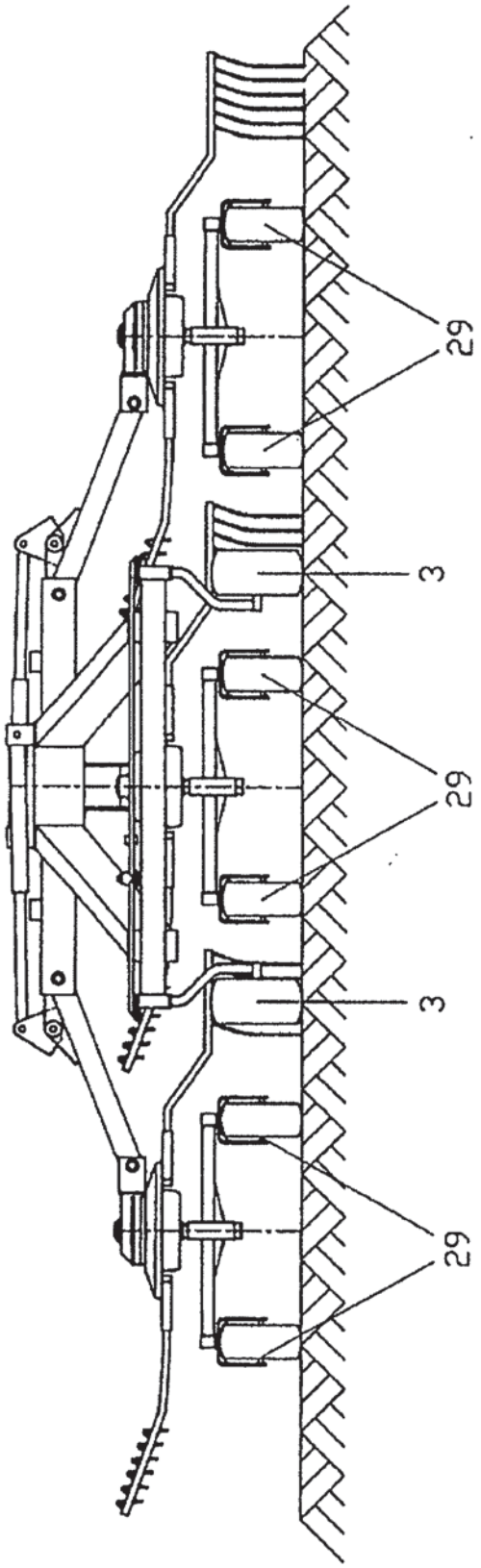

Fig.3

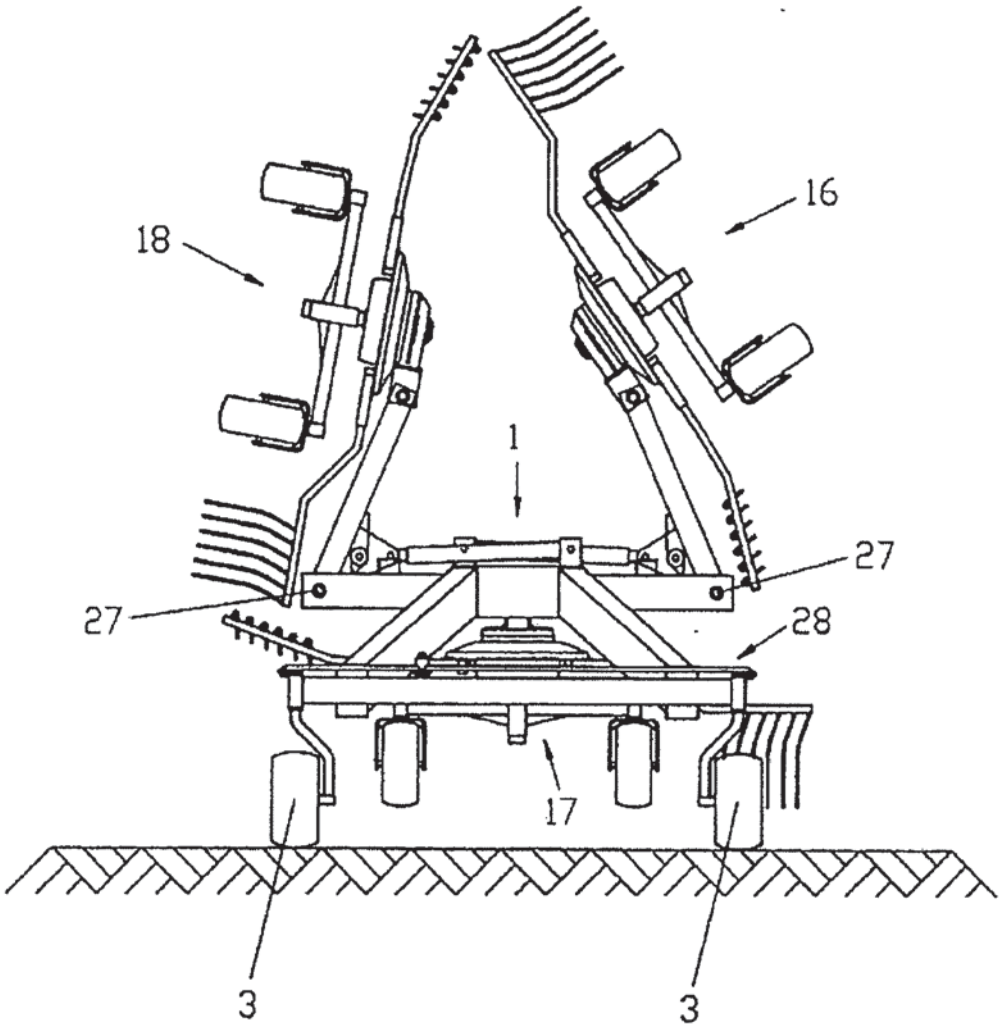

Fig.4

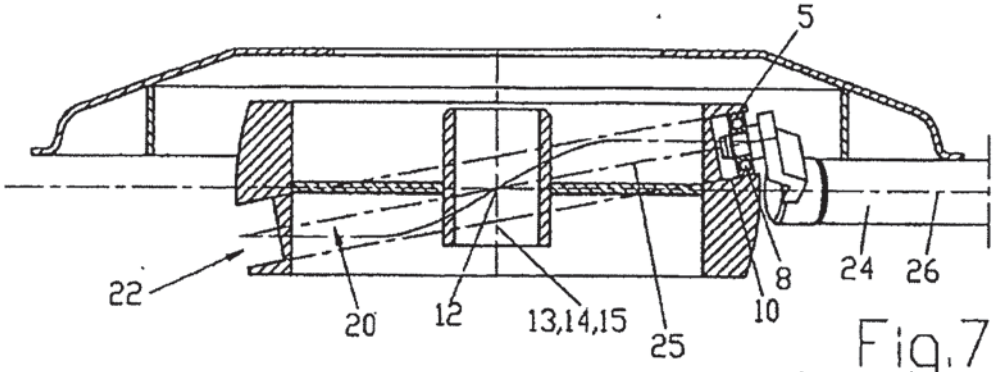

Fig.7

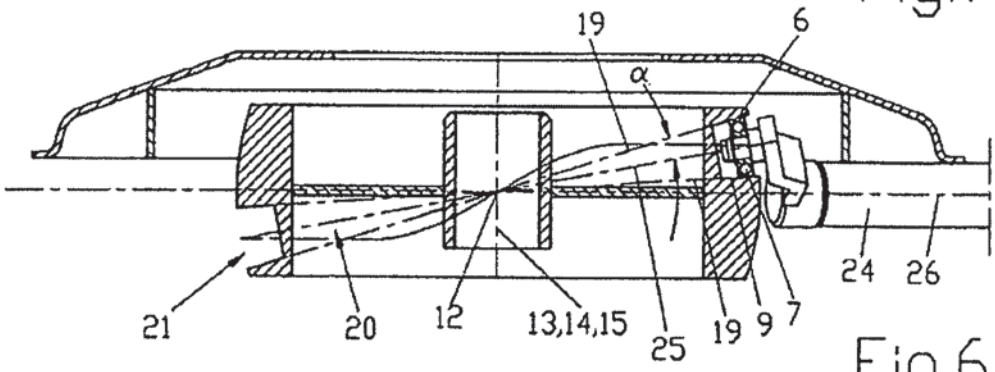

Fig.6

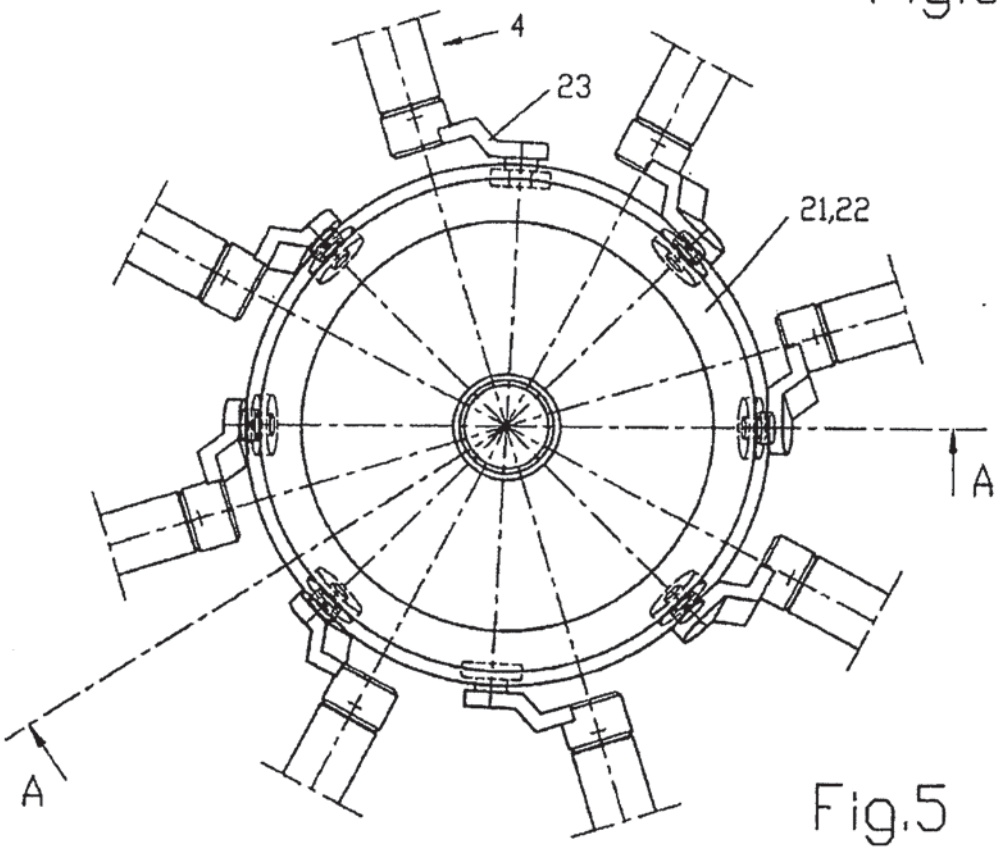

Fig.5

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 12821.0016USC2	Application Number: 12/925,405
	Applicant: DOW et al.	
	Filing Date: October 19, 2010	Group Art Unit: 3671

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EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

*Substitute Disclosure Statement Form (PTO-1449)

FORM 1449* INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION (Use several sheets if necessary)	Docket Number: 12821.0016USC2	Application Number: 12/925,405
	Applicant: DOW et al.	
	Filing Date: October 19, 2010	Group Art Unit: 3671

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EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form for next communication to the Applicant.

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23552
PATENT TRADEMARK OFFICE

EXAMINER	DATE CONSIDERED

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Союз Советских Социалистических Республик

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ОПИСАНИЕ ИЗОБРЕТЕНИЯ

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(54) СЕНОУБОРОЧНАЯ МАШИНА

1

Изобретение относится к сельскохозяйственному машиностроению, а именно к устройству сеноуборочных машин.

Известна сеноуборочная машина, включающая подбирающее устройство и расположенный за ним поперечный валкообразующий транспортер [1].

Недостатком известной машины является невозможность использования ее для ворошения и вспушивания валков и прокосов без перемещения их на другое место.

Целью изобретения является универсализация машины путем использования ее для ворошения и вспушивания массы.

Указанная цель достигается тем, что валкообразующий транспортер снабжен шарнирно установленным ветровым щитом, смонтированным с возможностью поворота и фиксации в вертикальном и наклонном положениях и винтовым отвалом.

На фиг. 1 изображена сеноуборочная машина, состоящая из двух секций, навешенная на трактор, при сгребании одного валка сена по центру; на фиг. 2 — разрез *А—А* фиг. 1; на фиг. 3 — то же, при сгребании двух валков сена; на фиг. 4 — то же, при сгребании одного бокового валка; на фиг. 5 — то же, при оборачивании двух валков; на фиг. 6 — винтовой отвал валкообразующего транспортера; на фиг. 7 — сеноуборочная машина при ворошении прокосов.

2

На трактор *1* навешена сцепка *2* сеноуборочной машины, снабженная приводом *3*. К сцепке *2* шарнирно присоединены симметрично расположенные рамы *4* и *5* обеих секций, которые дополнительно соединены с трактором *1* растяжками *6* и *7* и опираются на самоустанавливающиеся опорные колеса *8*. На рамках *4* и *5* установлены подбирающие устройства *9*, выполненные в виде продольных транспортеров с зубьями *10*. За подбирающими устройствами *9* установлены соединенные с приводом *3* поперечные валкообразующие транспортеры *11* и *12*, снабженные ветровыми щитами *13* и *14*, установленными шарнирно с возможностью поворота и фиксации в вертикальном и наклонном положениях.

На концах поперечных валкообразующих транспортеров *11* и *12* установлены винтовые отвалы *15* для оборачивания валков.

За сцепкой *2* установлены пальцевые колеса *16* для ворошения средней части прокоса или дополнительный промежуточный короткий транспортер *17* с ветровым щитом *18*.

Подбирающие устройства *9* снабжены башмаками *19*, а рамы *4* и *5* — прижим-

ными подпружиненными пальцами *20* и гибкими чистиками *21*.

Сеноуборочная машина работает следующим образом.

При движении трактора *1* по прокосу посредством зубьев подбирающего устройства *9* сено поступает на поперечные валкообразующие транспортеры *11* и *12* посредством прижимных подпружиненных пальцев *20* и гибких чистиков *21*.

При ворошении и вспушивании прокосов скорость подбирающего устройства *9* увеличивается на 45%, ветровые щиты *13* и *14* переводятся в наклонное положение, и пальцевые колеса *16* устанавливаются за сцепкой *2*.

Благодаря такой конструкции сеноуборочной машины увеличивается ее универсальность, допускающая использование машины для сгребания сена в один или два валка, их оборачивание, для ворошения и вспушивания прокосов без образования валка.

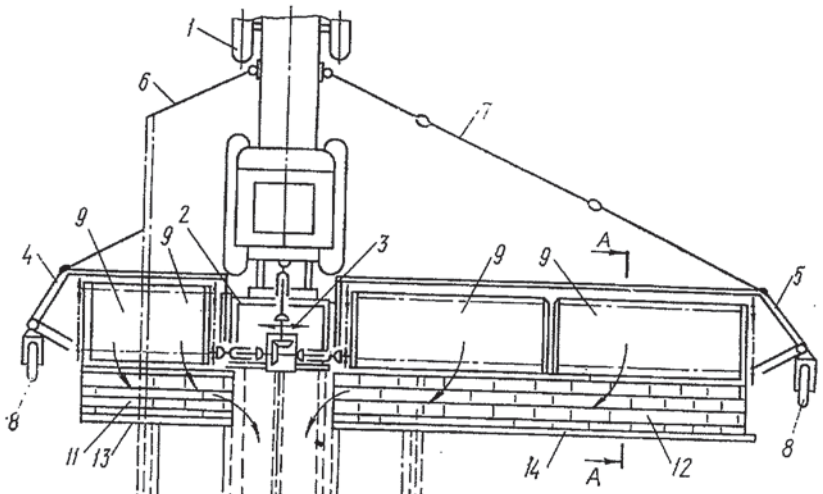
Формула изобретения

1. Сеноуборочная машина, включающая подбирающее устройство и расположенный за ним поперечный валкообразующий транспортер, отличающаяся тем, что, с целью универсализации машины путем использования ее для ворошения и вспушивания массы, валкообразующий транспортер снабжен шарнирно установленным ветровым щитом, смонтированным с возможностью поворота и фиксации в вертикальном и наклонном положениях.

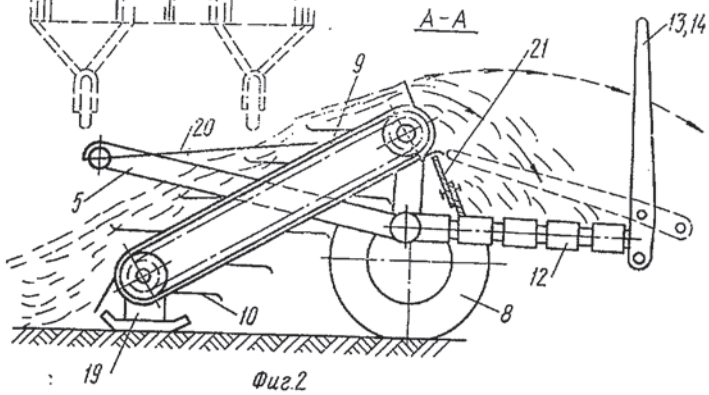
2. Сеноуборочная машина по п. 1, отличающаяся тем, что валкообразующий транспортер снабжен винтовым отвалом.

Источник информации, принятый во внимание при экспертизе:

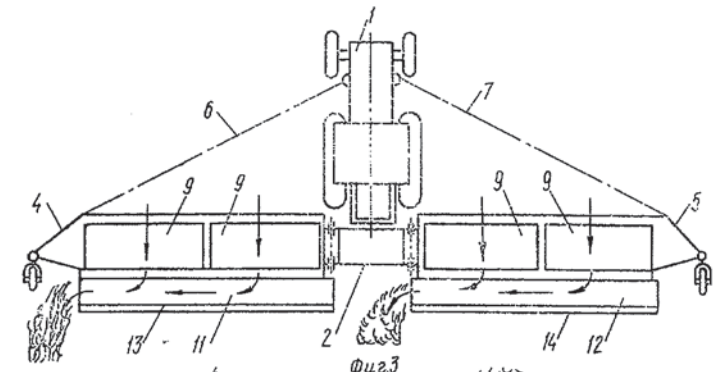
1. Патент ФРГ № 1757750, кл. A 01 D 84/00, 1973 (прототип).



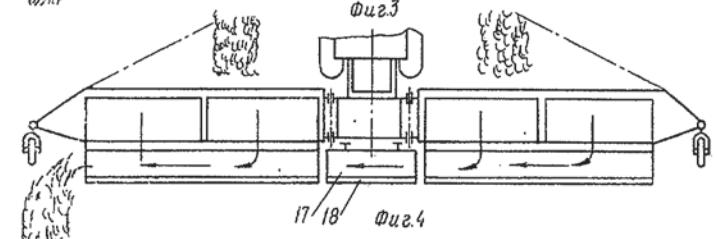
Фиг.1.



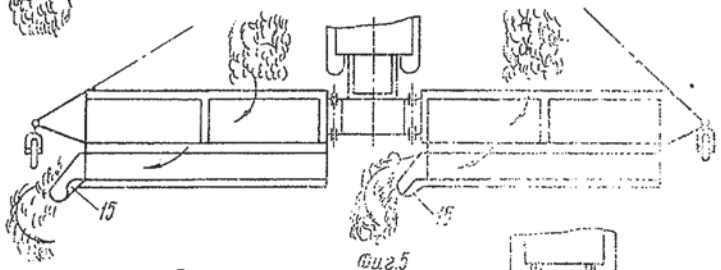
Фиг.2



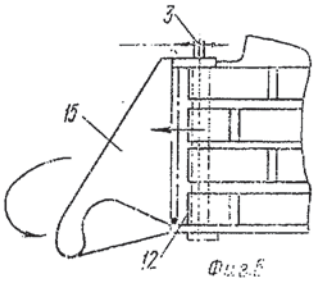
Фиг.3



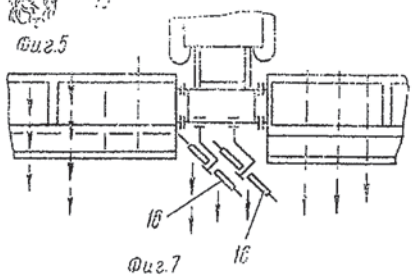
Фиг.4



Фиг.5



Фиг.6



Фиг.7

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Union of Soviet Socialist Republics

State Committee USSR For inventions and discoveries

Description of invention for inventor's certificate

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(45) Date of Publication of Description: June 26, 1981

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(53) UDC 631.353.2 (088.8)

(72) Inventors V. G. Zhavoronkin, V. G. Ermachkov and N. M. Zhurov

(71) Applicant The Frunze Design and Technological Institute for Fodder-Harvesting Machines

(54) HAYMAKING MACHINE

The invention relates to agricultural machine design, specifically to haymaking machines.

There is a known haymaking machine that includes a gathering device and, situated behind it, a transverse windrow-forming conveyor [1].

The shortcoming of the known machine is the impossibility of using it for turning and fluffing windrows and swaths without moving then to a different place.

The goal of the invention is universalization of the machine by using it to turn and fluff the mass.

This goal is achieved in that the windrow-forming conveyor is equipped with a hinged wind guard mounted with the possibility of being rotated and locked in the vertical and inclined positions and a helical blade.

Figure 1 shows the haymaking machine, which consists of two sections hitched to a tractor, in raking one row of hay through the center; Figure 2 shows section A-A in Figure 1; Figure 3 shows the same thing, in raking two rows of hay; Figure 4 shows the same thing, in raking one side windrow; Figure 5 shows the same thing, in turning over two windrows; Figure 6 shows the helical blade of the windrow-forming conveyor; Figure 7 shows the haymaking machine in turning swaths.

Hitch 2 of the haymaking machine, which is equipped with drive motor 3, is mounted on tractor 1. The symmetrically positioned frames 4 and 5 of both sections are articulately connected to hitch 2 and are additionally connected to tractor 1 by stays 6 and 7 and rest on autonomous support wheels 8. Gathering devices 9, which are made in the form of longitudinal

conveyors with teeth 10, are mounted on frames 4 and 5. Behind the gathering devices 9 are mounted the transverse windrow-forming conveyors 11 and 12, which are connected to drive motor 3, and which are provided with wind guards 13 and 14, which are articulately mounted with the capability of being rotated and locked in the vertical and inclined positions.

At the ends of the transverse windrow-forming conveyors 11 and 12 are mounted helical blades 15 for turning the windrows.

Behind hitch 2 are mounted finger wheels 16 for turning the middle part of the swath or an additional intermediate short conveyor 17 with wind guard 18.

The gathering devices 9 are equipped with shoes 19, while frames 4 and 5 are equipped with spring-operated pinch fingers 20 and flexible cleaners 21.

The haymaking machine operates in the following way.

As tractor 1 moves along a swath, by means of the teeth of the gathering device 9, the hay enters the transverse windrow-forming conveyors 11 and 12 by means of the spring-actuated clamp fingers 20 and flexible cleaners 21.

In the turning and fluffing of swaths the rate of the gathering device 9 increases by 45%, the wind guards 13 and 14 are moved to the inclined position, and the finger wheels 16 are mounted behind hitch 2.

Due to this design of the haymaking machine, its universality increases, which permits the use of the machine for raking hay into one or two windrows, turning the rows, and for turning and fluffing swaths without the formation of a windrow.

Claims

1. A haymaking machine that contains a gathering device and, situated behind it, a transverse windrow-forming conveyor, distinguished in that, with the goal of making the machine more universal by means of using it for turning and fluffing the mass, the windrow-forming conveyor is equipped with an articulately mounted wind guard, which is mounted with the possibility of being rotated and locked in the vertical and inclined positions.

2. A haymaking machine as in Claim 1, distinguished in that the windrow-forming conveyor is equipped with a helical blade.

Sources of information considered in examiner's evaluation:

1. FRG Patent No. 1757750, Cl. A 01 D 84/00, 1973 (prototype).

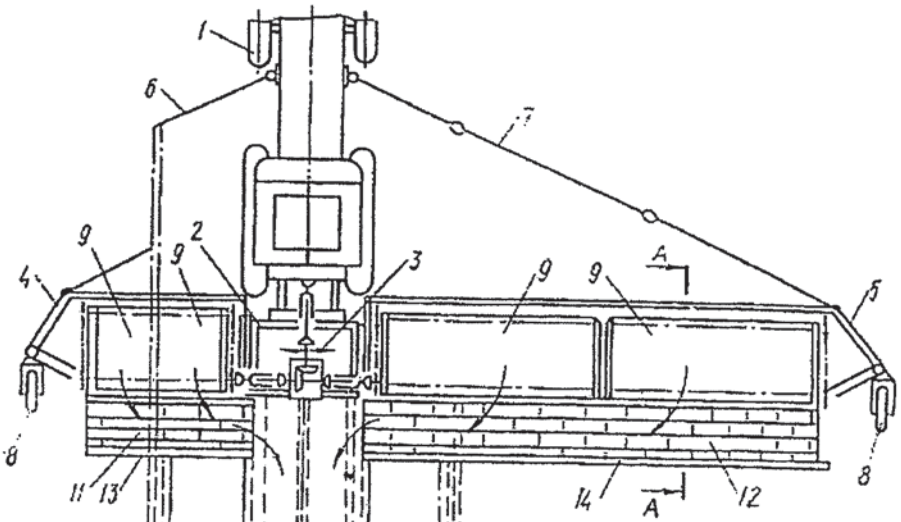

Figure 1

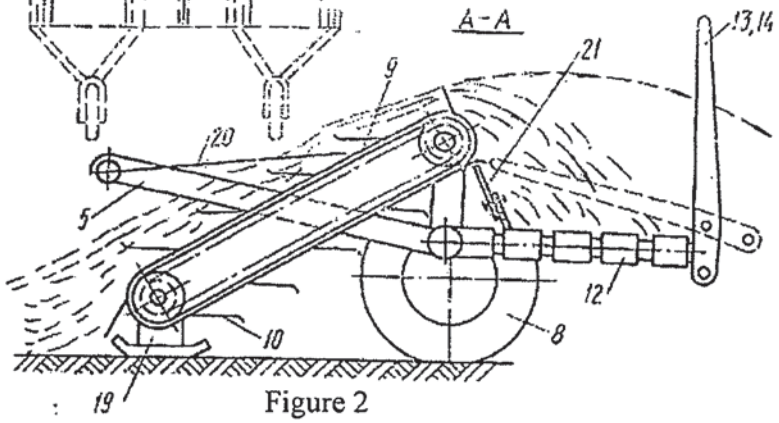

Figure 2

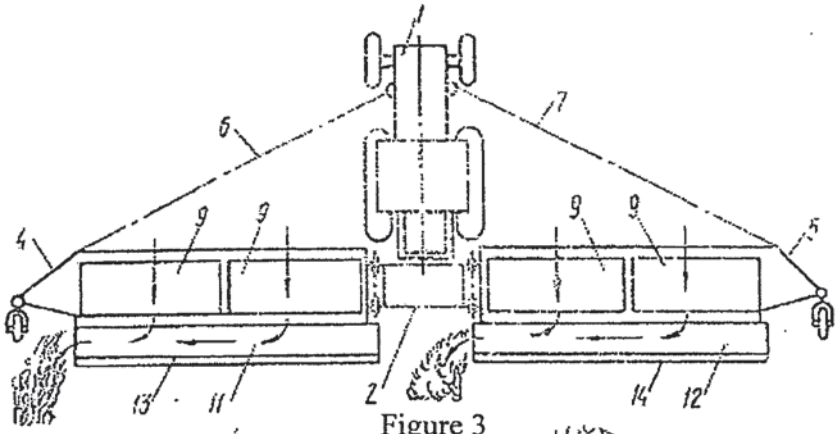

Figure 3

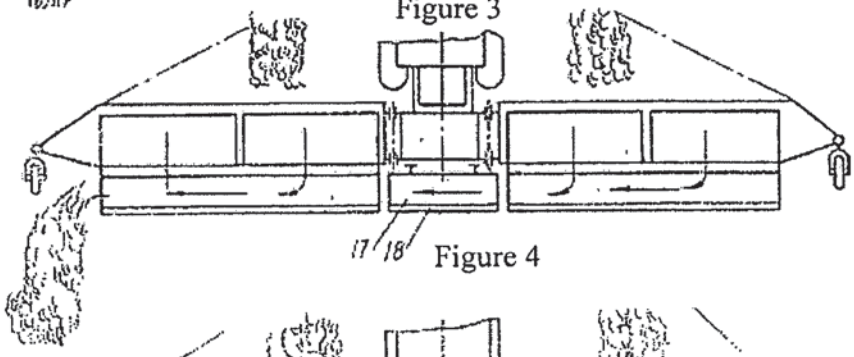

Figure 4

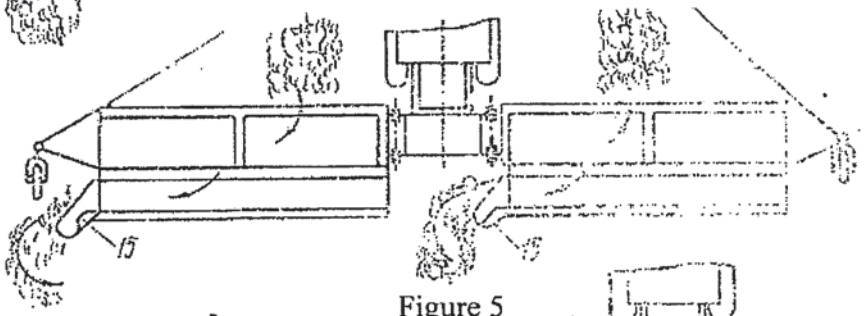

Figure 5

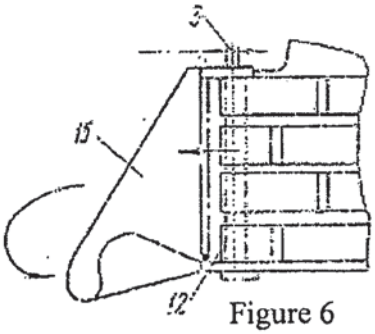

Figure 6

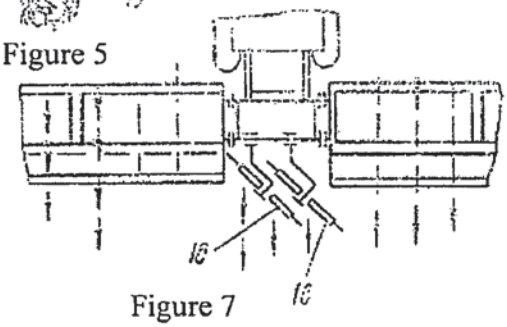

Figure 7