

Filed on behalf of
Precision Planting LLC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PRECISION PLANTING LLC
Petitioner

v.
MASCHIO GASPARDO S.P.A.
Patent Owner

Case No. IPR2024- 00008
U.S. Patent No. 8,770,121

Before: *To be determined*

**PETITION FOR *INTER PARTES REVIEW*
OF U.S. PATENT NO. 8,770,121.**

Table of Contents

Table of Authorities	8
I. Introduction	10
II. Identification of challenge	12
III. The '121 Patent.....	13
A. Subject Matter.....	13
B. Relevant Prosecution History.....	15
C. Discretionary Denial is Inappropriate.....	15
IV. Background	16
A. Applicant Admitted Prior Art.....	16
B. The Related European Patent.....	19
C. The European Opposition Proceeding	19
V. Level of Skill in the Art.....	21
VI. Claim Construction.....	21
A. “thrust-bearing element”	22
B. “supported rotatably in the movable portion”.....	25
C. “transmission drive shaft”	26
VII. Asserted Prior Art.....	30
A. U.S. Patent No. 7,228,807 to VenHuizen	30
B. E.P. Patent Application No. 0536543 to Fiorido	32
C. The Amazone Manual.....	34

VIII. The Challenged Claims Are Invalid.....	36
A. Anticipation	36
1. Ground 1: VenHuizen anticipates claims 1–3, 7–12, and 16 ...	36
a. Claim 1	36
i. “A seed distribution element for precision pneumatic seed drills, comprising:”	36
ii. “a sowing disc which is rotated by a motor-driven transmission drive shaft at controlled speed,”	36
iii. “a housing with a fixed portion and a portion which is movable relative to the fixed portion and can be closed against the fixed portion,”	38
iv. “a seed collection chamber being defined in the fixed portion,”	39
v. “a pneumatic suction chamber being defined in the movable portion,”	40
vi. “the sowing disc being interposed between the fixed and movable portions and having opposed surfaces delimiting the chambers,”	41
vii. “the sowing disc having at least one ring of selector holes extending between the opposed surfaces, and”	42
viii. “a seal which is arranged on the movable portion and is capable of sliding contact with the facing surface of the disc when the fixed and movable portions are closed against one another,”	43
ix. “wherein a pressure differential is provided between the opposed surfaces in the region of a circumferential segment of the ring of holes,” ..	44

x.	“wherein the seed distribution element further comprises a thrust-bearing element of the sowing disc,”	45
xi.	“which thrust-bearing element is supported rotatably in the movable portion in order to withstand at least some of the axial load produced by the disc on the seal.”	46
b.	Claim 2: “The seed distribution element according to claim 1, wherein the thrust-bearing element is rotated with the disc when the fixed and movable portions are closed against one another.”	48
c.	Claim 3: “The seed distribution element according to claim 1, wherein the thrust-bearing element comprises a thrust-bearing plate which can bear on that surface of the sowing disc which faces the seal, in a zone radially inside of the ring of holes.”	49
d.	Claim 7: “The seed distribution element according to claim 1, wherein the movable portion is hinged to the fixed portion.”	51
e.	Claim 8: “a sowing element for precision seed drills comprising a frame on which a seed distribution element according to claim 1 is mounted.”	51
f.	Claim 9: “A seed drill comprising a support structure on which a plurality of sowing elements according to claim 8 are mounted.”	52
g.	Claims 10–12 and 16	53
2.	Ground 2: Fiorido anticipates claims 1–5 and 10–14	56
a.	Claim 1	56
i.	“A seed distribution element for precision pneumatic seed drills, comprising:”	56

- ii. “a sowing disc which is rotated by a motor-driven transmission drive shaft at controlled speed,” 56
- iii. “a housing with a fixed portion and a portion which is movable relative to the fixed portion and can be closed against the fixed portion,” 58
- iv. “a seed collection chamber being defined in the fixed portion,” 59
- v. “a pneumatic suction chamber being defined in the movable portion, ...59
- vi. “the sowing disc being interposed between the fixed and movable portions and having opposed surfaces delimiting the chambers,” 60
- vii. “the sowing disc having at least one ring of selector holes extending between the opposed surfaces, and” 61
- viii. “a seal which is arranged on the movable portion and is capable of sliding contact with the facing surface of the disc when the fixed and movable portions are closed against one another,” 62
- ix. “wherein a pressure differential is provided between the opposed surfaces in the region of a circumferential segment of the ring of holes,” ..63
- x. “wherein the seed distribution element further comprises a thrust-bearing element of the sowing disc,” 64
- xi. “which thrust-bearing element is supported rotatably in the movable portion in order to withstand at least some of the axial load produced by the disc on the seal.” 65

b.	Claim 2: “The seed distribution element according to claim 1, wherein the thrust-bearing element is rotated with the disc when the fixed and movable portions are closed against one another.”	66
c.	Claim 3: “The seed distribution element according to claim 1, wherein the thrust-bearing element comprises a thrust-bearing plate which can bear on that surface of the sowing disc which faces the seal, in a zone radially inside of the ring of holes.”	67
d.	Claim 4: “the seed distribution element according to claim 3, wherein the thrust-bearing element comprises a drive element which is fixed for rotation with the plate and can be coupled with the drive shaft of the disc when the fixed and movable portions are closed against one another.”	68
e.	Claim 5: “The seed distribution element according to claim 4, wherein the drive element is self-centring relative to the drive shaft.”	69
f.	Claims 10–14.....	70
B.	Obviousness.....	71
1.	Ground 3: Fiorido combined with VenHuizen and Applicant Admitted Prior Art render obvious claims 1–5, 7–14, and 16.....	71
2.	Motivation to Combine	73
3.	Reasonable expectation of success.....	74
4.	Ground 4: Amazone combined with Fiorido, VenHuizen, and Applicant Admitted Prior Art render obvious claims 1–3, 7–12, and 16.	75
a.	Claim 1	75

- i. “A seed distribution element for precision pneumatic seed drills, comprising:” 75
- ii. “a sowing disc which is rotated by a motor-driven transmission drive shaft at controlled speed,” 75
- iii. “a housing with a fixed portion and a portion which is movable relative to the fixed portion and can be closed against the fixed portion,” 77
- iv. “a seed collection chamber being defined in the fixed portion,” 78
- v. “a pneumatic suction chamber being defined in the movable portion,” 78
- vi. “the sowing disc being interposed between the fixed and movable portions and having opposed surfaces delimiting the chambers,” 79
- vii. “the sowing disc having at least one ring of selector holes extending between the opposed surfaces, and” 80
- viii. “a seal which is arranged on the movable portion and is capable of sliding contact with the facing surface of the disc when the fixed and movable portions are closed against one another,” 81
- ix. “wherein a pressure differential is provided between the opposed surfaces in the region of a circumferential segment of the ring of holes,” ..82
- x. wherein the seed distribution element further comprises a thrust-bearing element of the sowing disc, which thrust-bearing element is supported rotatably in the movable portion in order to withstand at least some of the axial load produced by the disc on the seal.....83

b.	Claim 7: “The seed distribution element according to claim 1, wherein the movable portion is hinged to the fixed portion.”	87
c.	Claim 8: “A sowing element for precision seed drills comprising a frame on which a seed distribution element according to claim 1 is mounted.”	88
d.	Claim 9: “A seed drill comprising a support structure on which a plurality of sowing elements according to claim 8 are mounted.”	88
e.	Claims 10–12 and 16	89
IX.	Certification of Grounds for Standing	90
X.	Mandatory Notices Under 37 C.F.R. § 42.8	90
XI.	Payment of Fees Under 37 C.F.R. §§ 42.15(a) and 42.103	91
XII.	Conclusion.....	91
	Certification under 37 CFR § 42.24	93
	Certificate of Service on Patent Owner	94

Table of Authorities

Cases

<i>Adapt Pharma Operations Ltd. v. Teva Pharmaceuticals USA, Inc.</i> 25 F.4th 1354 (Fed. Cir. 2022).....	71, 73, 84
<i>Alloc, Inc. v. International Trade Commission</i> 342 F.3d 1361 (Fed. Cir. 2003).....	27
<i>Almirall LLC v. Amneal Pharmaceuticals LLC</i> 28 F.4th 265 (Fed. Cir. 2022).....	74
<i>Continental Circuits LLC v. Intel Corp.</i> 915 F.3d 788 (Fed. Cir. 2019).....	25
<i>Intel Corp. v. PACT XPP Schweiz AG</i> 61 F.4th 1373 (Fed. Cir. 2023).....	73, 84
<i>KSR Int’l Co. v. Teleflex Inc.</i> 550 U.S. 398 (2007).....	73, 84
<i>Lyft, Inc. v. RideShare Displays, Inc.</i> IPR2021-01602 (PTAB April 11, 2022)	16
<i>Noah Systems, Inc. v. Intuit, Inc.</i> No. 06-cv-933, 2010 WL 9096712 (W.D. Pa. May 7, 2010)	27
<i>TiVo, Inc. v. EchoStar Communications Group, Inc.</i> 262 F.3d 1258 (Fed. Cir. 2001)	27
<i>Varco, L.P. v. Pason Systems USA Corp.</i> 436 F.3d 1368 (Fed. Cir. 2006).....	27

Statutes

35 U.S.C. § 102	12, 30, 32, 34
35 U.S.C. § 103	12, 21

35 U.S.C. § 112	27
35 U.S.C. § 311	10
35 U.S.C. § 314	16
35 U.S.C. § 325	16

Regulations

37 C.F.R. § 42.100.....	10, 21
37 C.F.R. § 42.103.....	91
37 C.F.R. § 42.105.....	94
37 C.F.R. § 42.15.....	91
37 C.F.R. § 42.24.....	93
37 C.F.R. § 42.8.....	90, 94

Other Authorities

<i>Interim Procedure For Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (June 1, 2022)</i>	16
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Precision Planting LLC (“Precision”), in accordance with 35 U.S.C. § 311 and 37 C.F.R. § 42.100 *et seq.*, respectfully requests *inter partes* review of claims 1–5, 7–14, and 16 of U.S. Patent No. 8,770,121 (“the ’121 patent”) (Ex.1001), assigned to Maschio Gaspardo S.p.A. (“Maschio”).

I. Introduction

The ’121 patent is related to vacuum seed meters used on farm implements to plant seeds in a precisely controlled manner to maximize the efficiency of a planted crop. Its two independent claims, 1 and 10, generally recite two portions of the housing of the seed meter and a seed disc that is rotatably driven within the housing and splits the seed meter in two halves: a fixed side attached to the farm implement that together with the seed disc forms a seed chamber in the housing, and a movable side that together with the seed disc forms a vacuum chamber in the housing. The vacuum chamber side includes a seal to help create the vacuum on the seed disc so that as the disc rotates within the housing it transmits a pressure differential through a ring of perforations on the disc periphery. The seeds are sucked onto the disc that then transports them around the housing. When the perforations enter a non-vacuum zone, the seeds fall from the disc to be planted. The vacuum causes the disc to exert pressure on the seal. The ’121 patent’s independent claims further recite a “thrust-bearing element that is supported rotatably in the movable portion in order to

withstand at least some of the axial load produced by the disc on the seal.” This reduces seal wear.

Before the ’121 patent, the use of seed meters, including the two sides of the seed meter housing corresponding to seed chamber and vacuum chamber sides, was well known. The ’121 patent acknowledges the prior art disclosed “a thrust-bearing element which relieves the heavy load on the seal.” (Ex.1001, 1:53–55.) But according to the ’121 patent, the prior art presented a problem: the seal on the vacuum side of the housing was still subject to wear and was provided on the *fixed* side of the housing (rather than the *movable* side), which purportedly increased the required maintenance effort and corresponding maintenance downtime of the planter. (Ex.1001, 1:66–2:19.) Thus, the ’121 patent’s claimed solution was to simply switch the known seal and thrust-bearing arrangement from the seed meter housing’s fixed side to its movable side. (*See* claims 1, 10.)

But the ’121 patent’s claimed solution is not novel or non-obvious. Prior art anticipates and renders obvious the challenged claims of the ’121 patent. The European Patent Office (“EPO”) has already invalidated a European counterpart having substantively identical claims to the ’121 patent and making the same priority claim. The ’121 patent’s own admissions about the state of the art and the prior art itself show the EPO’s conclusion to be well-reasoned and cogent. The challenged claims of the ’121 patent should be found invalid.

II. Identification of challenge

Precision challenges claims 1–5, 7–14, and 16 of the '121 patent and requests that these claims be found unpatentable under 35 U.S.C. §§ 102 and 103 over the prior art and the prior general knowledge of a person of ordinary skill in the art (“POSA”). The following qualifies as prior art under pre-AIA 35 U.S.C. § 102(b) and § 103 and is pertinent to the challenge herein:

Exhibit	Prior Art Description	Prior Art Date
Ex.1001	Applicant Admitted Prior Art (“AAPA”)	Admitted before November 12, 2010
Ex.1006	U.S. Patent No. 7,228,807 to VenHuizen (“VenHuizen”)	June 12, 2007
Ex.1007	E.P. Patent No. 0536543 to Fiorido (“Fiorido”)	October 7, 1991
Ex.1011	Amazone Manual (“Amazone”)	October 2005

Precision requests *inter partes* review on the following grounds, as explained by Dr. Mark Fleming, at least a POSA at the time of the '121 patent:

Ground	Claim(s)	Proposed Statutory Rejections for the '121 Patent
1	1–3, 7–12, 16	35 U.S.C. § 102(b) – Anticipated by VenHuizen
2	1–5, 10–14	35 U.S.C. § 102(b) – Anticipated by Fiorido
3	1–5, 7–14, 16	35 U.S.C. § 103(a) – Obvious over Fiorido in view of VenHuizen and AAPA
4	1–3, 7–12, 16	35 U.S.C. § 103(a) – Obvious over Amazone in view of Fiorido, VenHuizen, and AAPA

III. The '121 Patent

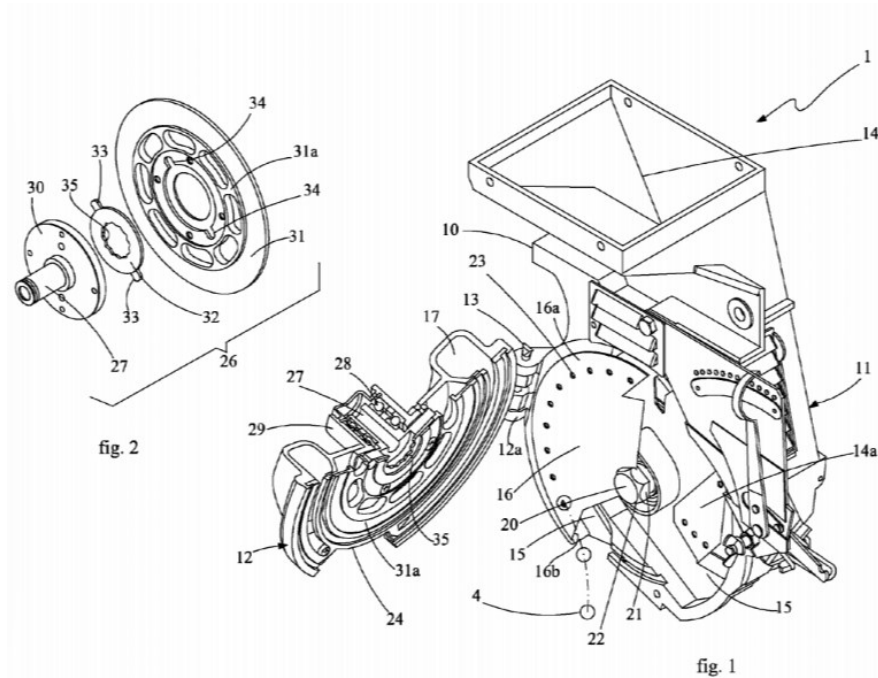
A. Subject Matter

The '121 patent issued July 8, 2014 based on a PCT application filed November 10, 2011 (and entering U.S. national phase October 8, 2012). (Ex.1001.) The earliest priority date for the '121 patent is based on the parent of this PCT application: Italian Patent No. PD2010A0338, filed November 12, 2010. (*Id.*)

In three figures and three columns of written description, the '121 patent describes a seed distribution element for precision pneumatic seed drills (*id.*, claims 1–9) as well as a “kit” for retrofitting seed distribution elements of precision pneumatic seed drills (*id.*, claims 10–16). The seed distribution element has a sowing disc rotated by a motor-driven transmission drive shaft and a housing with a fixed portion and a movable portion closable against the fixed portion. (*Id.*, claims 1, 10) The sowing disk is interposed between the fixed and movable portions, delimiting a seed collection chamber defined in the fixed portion from a pneumatic suction chamber defined in the movable portion. (*Id.*) The seed distribution element also includes a seal arranged on the movable portion, in sliding contact with the facing surface of the disc when the fixed and movable portions are closed against one another. (*Id.*)

A pressure differential is provided between opposed surfaces of the sowing disc in a region of a circumferential segment of a ring of holes of the sowing disc.

(*Id.*) The seed distribution element has a thrust-bearing element supported rotatably in the movable portion in order to withstand at least some axial load produced by the sowing disc on the seal. (*Id.*) An example of this arrangement is depicted below in figures 1–2.



The '121 patent discloses undesired wear to the pneumatic seal from the sowing disc rotatably sliding against it while also compressing the seal due to the suction effect in the pneumatic suction chamber, but admits this problem was previously addressed with a rotatable thrust-bearing element. (*Id.*, 1:38–55.) The thrust-bearing element relieves the heavy load on the seal, and its location in the movable portion of the housing purportedly allows for easier retrofitting. (*Id.*, 1:38–55, 4:1–9.)

The '121 patent states that it is “obligatory” to mount the transmission that drives the motor-driven shaft (which rotates the disc) on the fixed portion. (*Id.*, 1:63–65.) Furthermore, the '121 patent states that the presence of the transmission requires the motor-driven drive shaft 20 to be mounted on the fixed portion of the housing. (*Id.*, 2:60–65.) The drive shaft is described as being driven in rotation at predetermined adjustable speeds by a transmission which is not shown. (*Id.*, 2:60–63.) The claims recite only the sowing disc being “rotated by a motor-driven transmission drive shaft at controlled speed.” (*Id.*, claims 1, 10.)

B. Relevant Prosecution History

The '121 patent was filed in the U.S. on October 8, 2012, and issued July 8, 2014. (*Id.*, at 1.) Prosecution of the '121 patent is not substantively pertinent to claim construction or application of the prior art but is provided for completeness. (Ex.1002.)

C. Discretionary Denial is Inappropriate

Two pieces of prior art cited herein—VenHuizen and Fiorido—are listed on the face of the '121 patent. But neither the USPTO nor Maschio discussed either reference during prosecution. (*See generally id.*) Rather, the examiner failed to appreciate both VenHuizen’s and Fiorido’s teachings—as is evidenced at least in part by the EPO’s finding of anticipation of substantively identical claims by VenHuizen. (*See* Ex.1005 at 226–44.) Hence the '121 patent’s claims are effectively

unexamined in light of their disclosures, and discretionary denial of this petition under 35 U.S.C. §§ 314(a), 325(d) is not appropriate. *Interim Procedure For Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation* (June 1, 2022); *Lyft, Inc. v. RideShare Displays, Inc.*, IPR2021-01602, Paper 7, at 14–15 (PTAB Apr. 11, 2022). Moreover, Amazone was not cited, and therefore neither Amazone nor its combination with Fiorido was previously considered.

IV. Background

A. Applicant Admitted Prior Art

The '121 patent's "description" section admits that much of what is disclosed in the specification of the '121 patent is known in the prior art (emphases added):

- “In precision pneumatic seed drills *it is known to use sowing elements which are each equipped with a seed distribution element* (hereinafter, in brief, distributor) for distributing one seed at a time *in a controlled delivery* while the sowing element moves along a sowing track.” (Ex.1001, 1:19–23.)
- “It is *equally known* to use seed distributors which use an air pressure differential between opposed faces of a sowing disc (or selector) provided with one or more rings

of through holes. The operating principle is based on the fact that, *as a result of the pressure differential between the opposed faces of the disc, a seed adheres to each hole and is then transported by the rotation of the sowing disc from the seed selection zone to the point at which the pressure differential ceases and the seed is released to drop through a sowing pipe into the furrow or sowing track.* In practice, on one of the faces of the disc a strong air suction is exerted which retains the seeds on the opposite face in the region of the respective holes.” (*Id.*, 1:24–35.)

- “For the correct functioning of *such distributors* it is necessary to ensure an effective pneumatic seal between the face of the disc that is subjected to suction and *a seal which delimits the pneumatic suction chamber.*” (*Id.*, 1:38–41.)
- “[S]eed drills have been developed which are equipped with a thrust-bearing element which relieves the heavy load on the seal. In all cases, however, the thrust-bearing element, *which must be rotated with the disc*, is mounted

on the fixed portion of the housing, that is to say, that portion which is fixed to the framework of the sowing elements. This means the disc must be attached to the thrust-bearing element” (*Id.*, 1:53–58.)

- “[I]n the known machines [] it is obligatory to mount on the fixed portion the transmission which drives in rotation the motor-driven shaft which rotates the disc.” (*Id.*, 1:63–65.)
- “The sowing element 2, besides the distribution element 1, comprises a frame 6 and a seed or store hopper 7, besides other devices which are known per se and not necessary for the understanding of the present invention.” (*Id.*, 2:37–41.)

Relatedly, a POSA knows a motor and transmission operate with the seed disc disclosed in the ’121 patent because motive force must be generated (through known means like a direct motor connection or motor- or ground-driven wheels) that is then transferred with a transmission to cause the seed discs to rotate within the seed meter housing. Indeed, the use of a motor and transmission is so well known, the ’121 patent itself does not disclose any details about those elements or their incorporation into claimed elements of the ’121 patent. (*See id.*, 2:60–63.)

B. The Related European Patent

The '121 patent identifies Enrico Bragatto of Italy as the inventor and claims priority through PCT application No. PCT/EP2011/069875 filed November 10, 2011 to Italian application PD2010A0338 filed November 12, 2010. (*Id.*, INID codes 22, 30, 75, 86.) European Patent EP2637492 B1 (the “European patent”) identifies the same inventor and claims the same priority. (Ex.1004, INID codes 22, 30, 72, 86.) The '121 patent and European patent share a common specification and figures. (Exs.1001, 1004.) The claims of the European patent are substantively identical to the '121 patent. (Ex.1001, 4:12–6:25; Ex.1004, 9:5–11:15.)

C. The European Opposition Proceeding

Precision sought review of the European patent’s substantively identical claims. On September 2, 2015, a petition challenging the claims of the European patent was filed based upon a number of prior art patents. VenHuizen (Ex.1006) was alleged to invalidate the claims of the European patent (Ex.1004). The EPO concluded that VenHuizen anticipated the independent claims of the European patent notwithstanding Maschio’s argument that the “handle” of VenHuizen was not a thrust-bearing element.¹ (Ex.1005 at 513–16.) In particular, with respect to VenHuizen, referenced as “D1” in the opposition proceeding, the EPO concluded:

¹ Maschio did not argue the validity of the challenged dependent claims, stating “[w]ith reference to dependent claims 2 to 11, as they incorporate the subject

The seed distribution element further comprises a thrust-bearing element of the sowing disc in the form of a hub handle 58 attached to the distal edge of a retaining hub 56 whereby the hub is connected to the drive shaft 55 (column 6, lines 22 to 27, figure 6), The hub handle is positioned in the movable portion (figure 6). As the hub handle is attached to the retaining hub, rotation of the hub to rotate the disc will forcibly rotate the hub handle 58. The handle 58 is thus rotatably supported in the movable portion. As the handle has to retain the seed disc on the hub 56 (column 5, lines 66, 67) at least some of the axial load produced by the seed disc on the seal is forcibly withstood.

Thus all features of claim 1 of the first auxiliary request are known from D1. This reasoning is also applicable to the subject matter of claim 10 as the claimed distribution elements are known from D1 and are suitable

matter of independent claim 1, they are also to be regarded novel and involving the an inventive step.” (Ex.1005 at 676.)

to retrofit a seed distribution element of precision
pneumatic seed drills.

(*Id.* at 514.)

Thus, the claims of the European patent were found to be invalid over VenHuizen. Although Maschio submitted “auxiliary” claims at the EPO that were determined to be patentable subject to appeal, the narrowing limitations of those added claims are not present in the challenged claims of the ’121 patent.

V. Level of Skill in the Art

Considering the legal factors weighed in determining the level of ordinary skill in the art, a POSA as of November 12, 2010, would have had at least a bachelor’s degree in mechanical or agricultural engineering and 2–4 years experience in the design or manufacture of agricultural equipment. (Ex.1003 ¶32.) A POSA would have been familiar with the design and operation of known seed distribution meters and with the use of bearings and other plate-like technologies to receive and distribute axial loads by providing bearing surfaces for the transfer of forces. (*Id.* ¶33.)

VI. Claim Construction

In this proceeding, claims are interpreted under the *Phillips* standard applied by Article III courts. 37 C.F.R. § 42.100(b); *see also* 83 Fed. Reg. 197 (Oct. 11, 2018). Unless otherwise indicated, words in a claim are given their ordinary

meaning, which is the meaning understood by a POSA in view of the patent and file history. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (*en banc*).

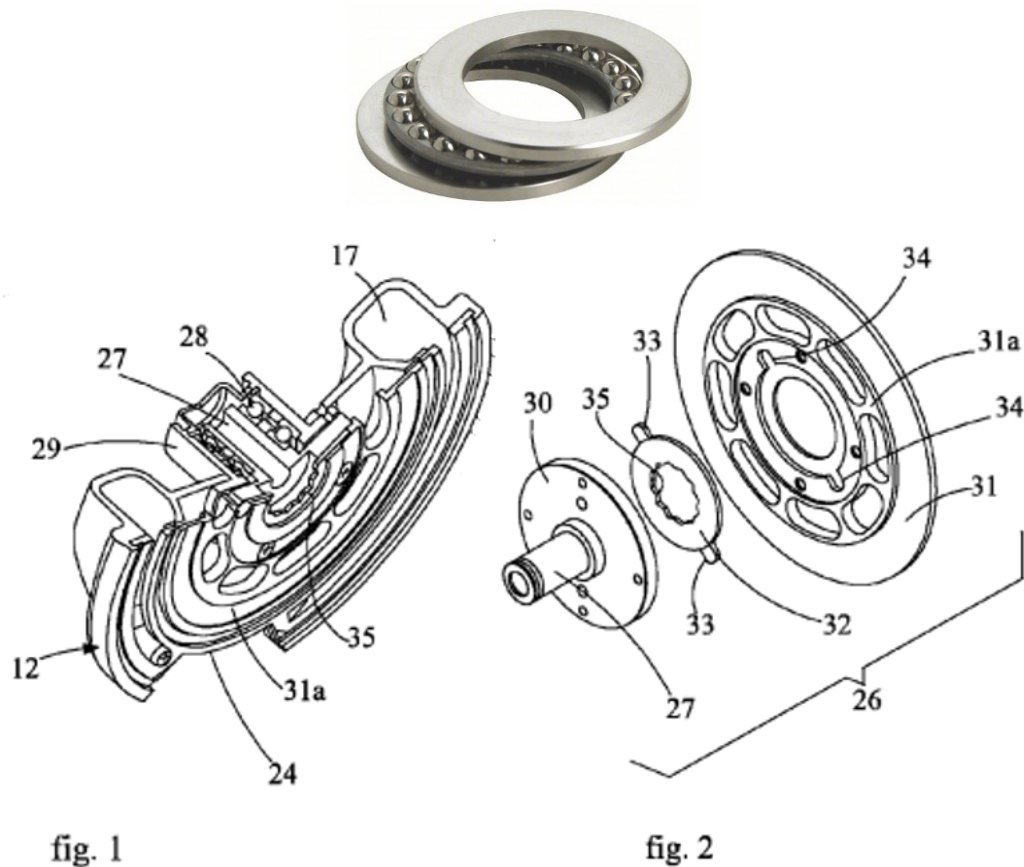
Precision provides definitions for the following anticipated claim terms.

Claim term	Construction
“thrust-bearing element”	an element that provides support against an axial force
“supported rotatably in the movable portion”	located in the movable portion, however the element may be rotatably supported
“transmission drive shaft”	a drive shaft mounted on the fixed portion of the housing and centered relative to the sowing disc

A. “thrust-bearing element”

The limitation “a thrust-bearing element of the sowing disc, which thrust-bearing element is supported rotatably in the movable portion” is recited in independent claims 1 and 10 and is therefore present in all challenged claims. While a “thrust bearing” is well-known in the art as a “bearing which sustains axial loads and prevents axial movement of a loaded shaft” (Ex.1017 at 3), the patentee gave the words a slightly different meaning in the ’121 patent. By using a hyphen to connect the words “thrust” and “bearing,” the patentee uses them adjectivally to describe the generic word “element” in the combined limitation.

Indeed, a comparison of a photo of a traditional thrust bearing (below, top) with numbered thrust-bearing element 26 in Figures 1 and 2 of the '121 patent (below, bottom) shows differences between the two structures:



The '121 patent states that the “thrust-bearing element 26 comprises a shaft 27 rotatably mounted by means of bearings 28 in a seat 29 of the movable portion 12. The shaft 27 has flanging 30 by means of which it is fixed to a thrust-bearing plate² 31 which can bear on that surface of the disc which faces the seal 24 in a zone

² The “thrust-bearing plate” limitation is another example of adjectival use of “thrust-bearing.”

radially inside the ring of holes 23 in order to withstand at least some of the axial load produced by the disc 16 on the seal 24.” (Ex.1001, 3:25–32.) The “thrust-bearing plate” does not ride on bearings but is connected to the shaft. The shaft is supported by radial bearings that are not in-line with the axial force. Thus, the specification indicates that the term “thrust-bearing element” does not refer to a traditional “thrust bearing,” but more generally refers to an element that provides support against an axial force. A POSA who reads the specification would know that limiting the thrust-bearing element to the traditional meaning of a “thrust bearing” would result in the only “thrust-bearing element” disclosed in the specification not being covered by the claims. (Ex.1003 ¶¶46–47.)

The specification of the ’121 patent makes clear that a thrust-bearing element “relieves the heavy load on the seal” and “must be rotated with the disc.” (Ex.1001, 1:53–57.) The ’121 patent specification continues: “[i]n order to limit the wear on the seal 24 resulting from sliding against the surface of the disc 16, a thrust-bearing element indicated as a whole by 26, is mounted on the movable portion.” (*Id.*, 3:21–24.) The claims themselves clearly state that the function of the rotatably supported “thrust-bearing element” is to “withstand at least some of the axial load produced by the disc on the seal.” (*Id.*, 4:37–40, 6:2–6.)

The EPO reached a similar conclusion, reasoning that “thrust-bearing element” was a unique combination of the constituent terms and intended to convey

a broader meaning of function, which is that “of bearing or providing support against an axial force.” (Ex.1005 at 233–35.) Considering the purpose of the “thrust-bearing element” “to withstand at least some of the axial load produced by the disc on the seal,” (e.g., Ex.1001, 4:39–40), the EPO panel concluded that “any element that restrains the axial movement of the disc when vacuum is applied, as does the thrust-bearing element of the described embodiment, meets the claimed limitation.” (Ex.1005 at 233–35.) Thus, as used in the ’121 patent, a “thrust-bearing element” is any “element that provides support against an axial force.”

B. “supported rotatably in the movable portion”

The ’121 patent claims recite that the “thrust-bearing element is supported rotatably in the movable portion” of the housing. (e.g., Ex.1001, 4:38–39.) While the sole embodiment of the ’121 patent discloses the thrust-bearing element being mounted *on* the movable portion, and even describes it in that manner in the specification (*id.*, 3:21–24), the broader word “in” is recited in the claims. Thus, the claims require only that the thrust-bearing element be *located within* the confines of the movable portion—not necessarily *supported by* or otherwise *affixed to* the movable portion. There is no basis to limit the claims to the sole disclosed and preferred embodiment. *Continental Circuits LLC v. Intel Corp.*, 915 F.3d 788, 799–800 (Fed. Cir. 2019).

The claims’ recitation of the “seal which is arranged on the movable portion,” demonstrates that the claim itself distinguishes between “in” and “on.” Consequently, “supported rotatably in the movable portion” means “located in the movable portion, however the element may be rotatably supported.”

The EPO applied this plain meaning distinction between the words “on” and “in” to conclude, over Maschio’s arguments that tried to conflate the two terms, that “a thrust-bearing element located in the suction chamber [*i.e.*, the movable portion] and thus at the suction side of the rotating disk, is properly located to bear forces caused by that suction, however the element may be supported.” (Ex.1005 at 235.)

C. “transmission drive shaft”

The ’121 patent claims also recite that a “sowing disc is rotated by a motor-driven transmission drive shaft at a controlled speed.” (*e.g.*, Ex.1001, 4:15–16, 5:7–8.) Because the specification uses the terms “transmission,” “motor-driven,” “drive shaft,” and “shaft” inconsistently, it is unclear whether the claim language “transmission drive shaft” is referring to element 20 or to a larger assembly. The abstract appears to refer to element 20 as a “transmission shaft,” but elsewhere, the specification indicates the transmission is not shown (Ex.1001, 2:62–63.) And the specification makes no disclosure of a motor, notwithstanding the use of the phrase “motor-driven” in both the specification and the claims. (Ex.1003 ¶43.)

For purposes of this proceeding, assuming the term is construable and does not suffer frailties under 35 U.S.C. § 112, the specification defines the *location* of the claim term “transmission drive shaft.” The description states that “[t]he presence of the transmission *requires* the shaft 20 to be *mounted on the fixed portion* of the housing.” (Ex.1001, 2:64–65, emphases added.) Elsewhere, the description states “it is *obligatory* to *mount on the fixed portion* the transmission which drives in rotation the motor-driven shaft that rotates the disc.” (Ex.1001, 1:63–65, emphasis added; Ex.1003 ¶ 43.)

Generally, limitations to the claims may not be added when such limitations are found only in the specification. *Varco, L.P. v. Pason Sys. USA Corp.*, 436 F.3d 1368, 1373 (Fed. Cir. 2006). But “where the specification makes clear at various points that the claimed invention is narrower than the claim language might imply, it is entirely permissible and proper to limit the claims.” *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361, 1370 (Fed. Cir. 2003).

“[W]hen a patentee uses mandatory language such as ‘must’ or ‘necessary’ in describing a preferred embodiment, such language can limit or preclude other embodiments.” *Noah Sys., Inc. v. Intuit, Inc.*, No. 06-cv-933, 2010 WL 9096712, at *2 (W.D. Pa. May 7, 2010) (citing *TiVo, Inc. v. EchoStar Commc’ns Group, Inc.*, 262 F.3d 1258, 1271 (Fed. Cir. 2001)); Because the patentee states in the description of the preferred embodiment that the transmission drive shaft is “require[d]” to be

mounted on the fixed portion of the housing and confirms elsewhere in the specification that this configuration is “obligatory” (Ex.1001, 1:63–65, 2:64–54), the scope of the term should be limited accordingly.

The PTAB should further limit the scope of “transmission drive shaft” based on Maschio’s arguments in the European opposition proceeding. Maschio attorneys argued that Amazone “does not disclose [sic] a motor-driven transmission shaft rotated at a controlled speed a [sic] sowing disc” because “[i]t can be clearly seen from *e.g.* Fig. 39 in [sic] page 53 that the sowing disc is toothed and it is driven by a gear provided in the fixed portion.” (Ex.1005 at 674–75.)

The referenced figure from Amazone is reproduced below. It depicts the open housing of a seed distribution element:

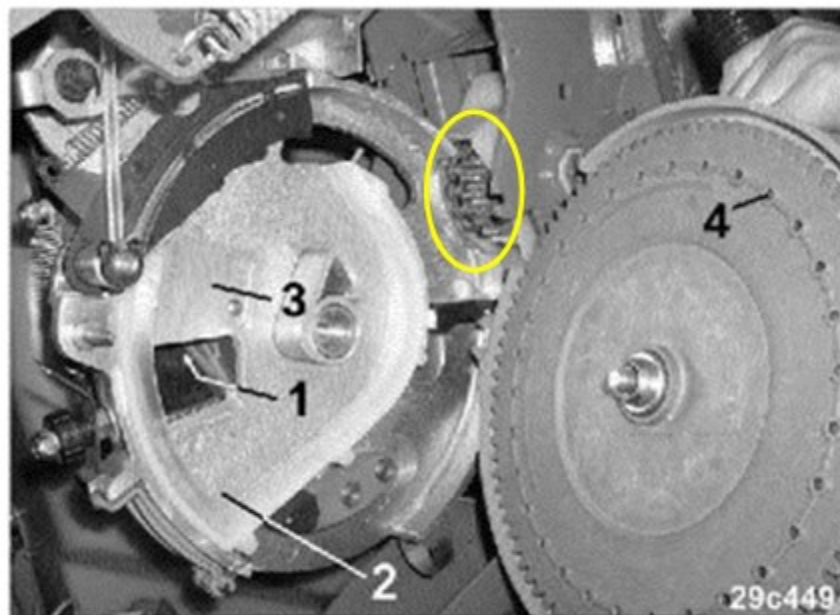
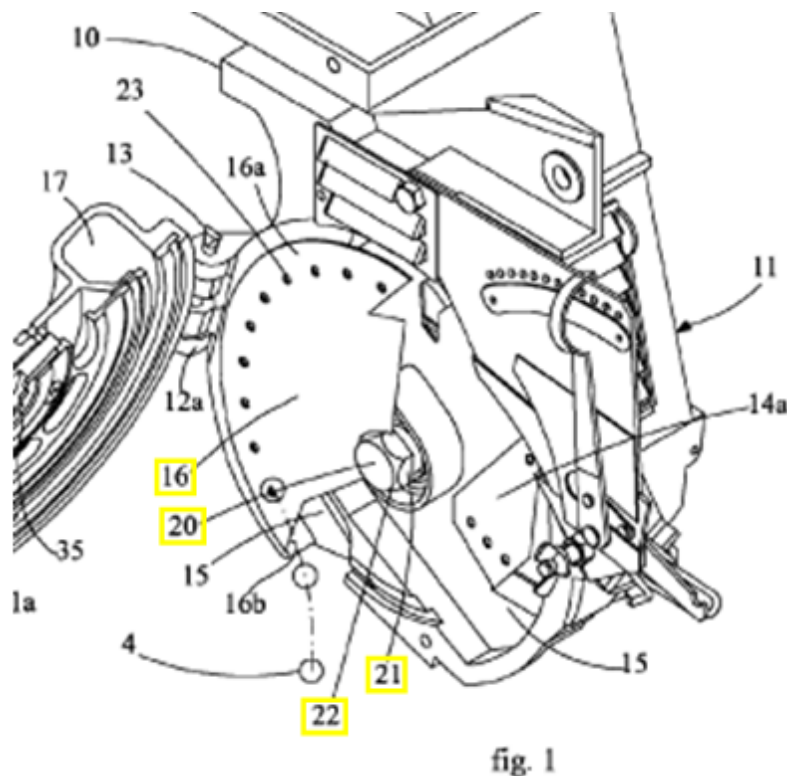


Fig. 39

(Ex.1003 ¶44, annotated.) The toothed sowing disc 4 is shown on the right side in the opened movable portion. The gear (highlighted) that drives the sowing disc is mounted along the periphery of the fixed portion.

In contrast, the '121 patent, which shares priority to the European patent involved in the opposition and has the same specification and figures, discloses only a *centrally located* drive shaft 20, which protrudes through the sowing disc 16 and is keyed to the disc by a polygonal profile 21 at its free end, with its chamfers 22 serving “to facilitate the centring [*sic*] of the two profiles and the respective engagement.”



(Ex.1001, 3:48–52.)

Maschio admitted the drive shaft was on the fixed portion. But Maschio argued in the European opposition that the peripherally driven shaft in the prior-art instruction manual is not a “transmission drive shaft” as understood in the claims and disclosed in the specification of the ’121 patent. (*See* Ex.1003 ¶44.) Based upon this argument and the ’121 patent’s disclosure, the term “transmission drive shaft” should be limited to a shaft that is centered relative to the sowing disc.

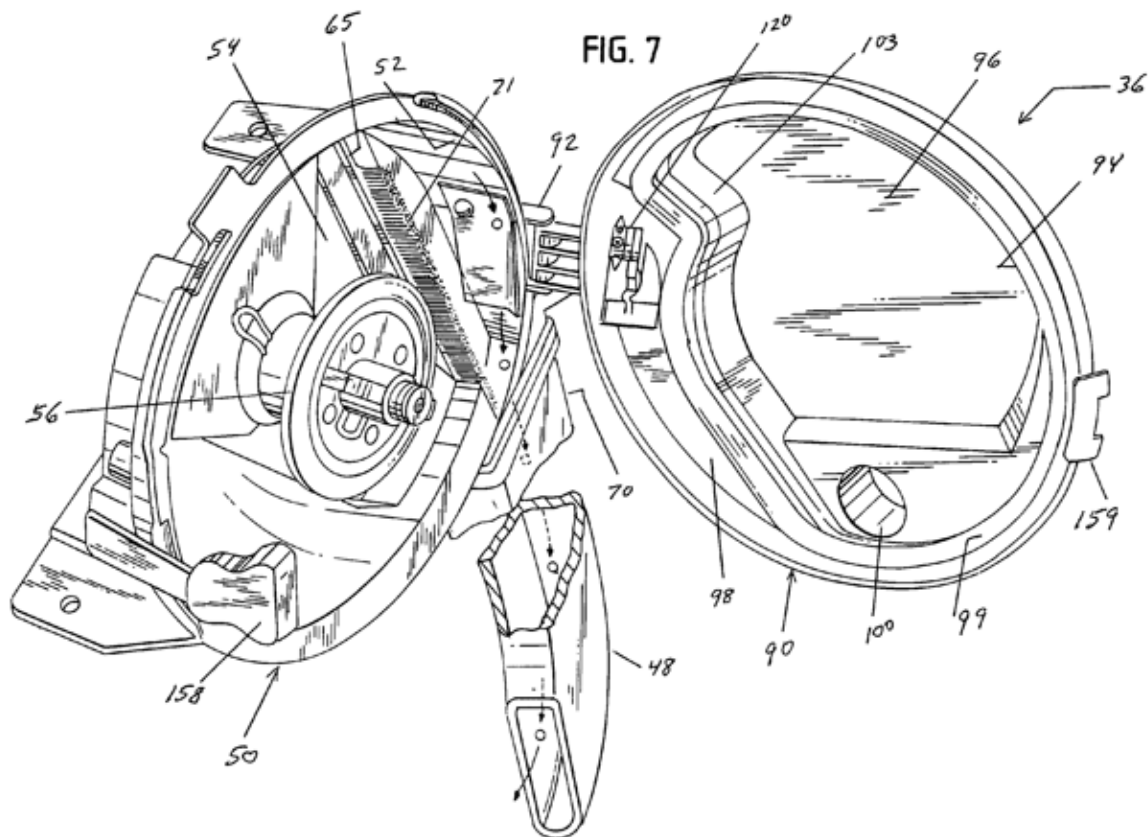
VII. Asserted Prior Art

A. U.S. Patent No. 7,228,807 to VenHuizen

VenHuizen was filed March 29, 2006 and issued June 12, 2007. (Ex.1006.) Therefore, VenHuizen is prior art under 35 U.S.C. § 102(b). VenHuizen was cited on the face of the ’121 patent but was not cited in any substantive rejections.

VenHuizen discloses a method of improving the efficiency of a planter having a metering unit having a circular rotatable seed disk. (Ex.1006, 3:10–21.) The seed disk has first and second opposing surfaces, and has a plurality of transverse spaced holes through the disk where the centers of the holes define a circle having its center at the center of the disk. (*Id.*) To select individual seeds for planting, seed is introduced into a first cavity in the housing defined by the first surface of the seed disk and a vacuum is drawn in a second cavity defined by the second surface of the seed disk such that the vacuum draws individual seeds against the transverse holes in the seed disk. (*Id.*)

VenHuizen further discloses the metering unit 36 including a second housing member 90 attached by a pivot pin 92 to the first housing member 50. (*Id.*, 7:19–21, Fig. 6.) As depicted in figure 1, along the length of a cross bar 14 are a plurality of row units 20. (*Id.*, 5:13–20, Fig. 1.) VenHuizen also discloses that each row unit 20 has a frame 24 on which is mounted a seed hopper 34. (*Id.*, 5:13–20, 27–39, Figs. 2–3.) Below the seed hopper is a metering unit 36 and a chute that directs seed from the hopper 32 to the metering unit 36. (*Id.*) Figure 7 of VenHuizen shows a isometric view of the metering unit shown in figure 6 with the metering unit open and the seed disk removed (*Id.*, 4:65–67, 5:59–6:18):



VenHuizen is analogous art to the '121 patent because VenHuizen is in the same field of endeavor of the '121 patent—a vacuum-based planter metering unit having a rotatable seed disk. (*Id.*, 3:10–21.) Moreover, VenHuizen is reasonably pertinent to the problem faced by the inventor of the '121 patent in that VenHuizen discloses a kit for modifying the metering unit of a planter to improve the efficiency thereof. (*Id.*, 2:32–40, 3:2–6.)

B. E.P. Patent Application No. 0536543 to Fiorido

Fiorido was filed September 7, 1992 and published April 14, 1993. (Ex.1007). Therefore, Fiorido is prior art under 35 U.S.C. § 102(b). Fiorido was cited on the face of the '121 patent but was not cited in any substantive rejections.

Fiorido discloses a pneumatic precision seed drill. (*Id.*, Title.) Fiorido's seed drill includes a perforated disk 13 rotatably driven via a shaft 29 and a cog wheel 30, for example. (*Id.*, 5:49–55.) A seed container 11 and a casing 12 are attachable and detachable to and from the seed container 11 by bolts or fasteners through projections 18, 19 and 181, 191, as depicted in figure 1. (*Id.*, 5:22–27.) The seed container 11 has a hopper 15 for loading the seeds and an unloading conduit 16 for depositing seeds. (*Id.*, 5:14–21.) The casing 12 has therein a suction slit 24 connected with an air suction device and open on a side facing the perforated disk enclosed between the container 11 and the casing 12. (*Id.*, 5:33–42.) The suction slit 24 is

open on the side facing the disk 13, with the disk perforations (ring of perforations 34) keeping the seeds adhering to the perforations during rotation of the disk 13. (*Id.*, 7:29–34.)

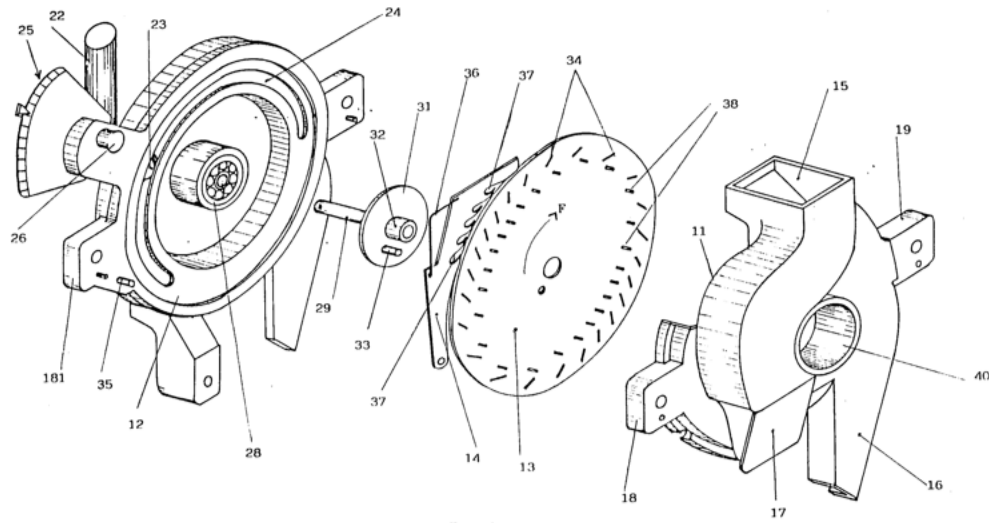


FIG. 3

(*Id.*, 5:5–6, Fig. 3.)

The driving disk 31 attaches via a shaft 29 to bearings 28 in the casing 12 containing the pneumatic chamber and the seal 39. (*Id.*, Figs. 2–3.) Figure 2, shows the driving disk 31 bearing on the surface of the perforated disk 13 on a surface that faces the seal 39, and the driving disc 31 is in a zone that is radially inside of the holes or perforations formed through the perforated disk 13. (*Id.*, Figs. 2–3.) The seed container 11 is provided with a central opening 40 to possibly introduce the support and driving elements for the disk 13 from the opposite side of the device, as opposed to the arrangement shown in Figures 2–3. (*Id.*, 8:1–6, Figs. 1–2.)

Fiorido is analogous art to the '121 patent because Fiorido is in the same field of endeavor of the '121 patent—a pneumatic seed drill. (*Id.*, 1:23–25.) Moreover, Fiorido is reasonably pertinent to the problem faced by the inventor of the '121 patent because it discloses the elements and arrangement of components in the vacuum seed meter intended to decrease machine downtime. (*Id.*, 1:6–18.)

C. The Amazone Manual

Amazone was published and available to the interested public by no later than January 2006 (Ex.1011). Amazone lists a publication date of October 2005, has a copyright date of 2005, was made available on the manufacturer's website by January 2006, and was translated from German in to multiple language in the same time frame. (Ex.1003 ¶¶61–69.) Based upon agricultural implement industry conventions, the dating of Amazone, the dating on the manufacturer's website, and cross-referencing differently translated manuals for the same machinery, Amazone was available to the interested public, including purchasers, users, and maintainers of equipment described therein, by no later than January 2006. (*Id.*) Therefore, Amazone is prior art under 35 U.S.C. § 102(b). The USPTO has not considered Amazone.

Amazone discloses a “precision airplanter” designed “for the metering and application of usual commercial kinds of seed and fertilizer” that is “coupled to a tractor via the three point linkage and operated by one person.” (Ex.1011 at 41.) As

depicted in Figures 39 and 40, below, Amazone discloses a “seed housing” (*Id.* at 36, Item 3 in Fig. 14) inside of which “The seed slips out of the seed hopper through the opening (Fig. 39/1) into the seed store area (Fig. 39/2) of the singling disc... The impeller provides the vacuum behind the holes (Fig. 39/4) of the rotating singling disc. The seeds are drawn by vacuum off the seed store area on to the holes (Fig. 39/4). The air leaves the seed housing via the slits (Fig. 40/1) of the suction kidney. On the deepest point (Fig. 40/2) of the singling disc the vacuum stops and the seed drops into the seed furrow formed by the sowing coulter.”

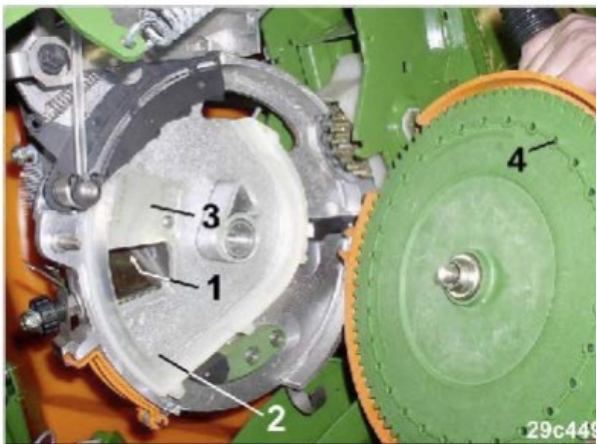


Fig. 39



Fig. 40

(Ex.1011 at 53.)

Amazone is analogous art to the '121 patent because it is in the same field of endeavor of the '121 patent—a “precision air planter” seed meter including a seal on the vacuum side of the seed meter that bears against the seed disc on the vacuum side. (Ex.1011 at 48, 53.) Moreover, Amazone is reasonably pertinent to the problem

faced by the inventor of the '121 patent because, as discussed *infra*, it discloses the vacuum side of the seed meter is located on the movable portion of seed meter housing and would, therefore, commend itself to the attention of the inventors of the '121 patent. (Ex.1011 at 53, Figs. 39–40; Ex.1003 ¶71.)

VIII. The Challenged Claims Are Invalid

A. Anticipation

All challenged claims of the '121 patent are anticipated.

1. Ground 1: VenHuizen anticipates claims 1–3, 7–12, and 16

a. Claim 1

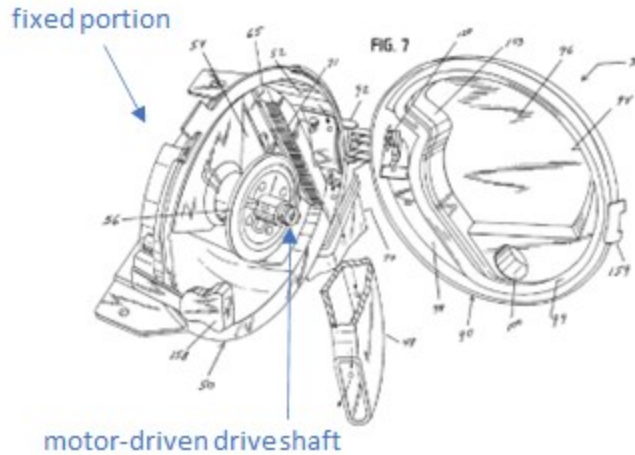
i. “A seed distribution element for precision pneumatic seed drills, comprising:”

VenHuizen discloses “[a] seed planter of the type having a metering unit with a seed chute that drops seeds into a seed tube for planting as manufactured by John Deer is provided...” (Ex.1006, Abstract.) The planter “retain[s] equal spacing between seeds” such as “one seed every six inches along the trough.” (*Id.*, 1:7–9, 1:58–60; *see also* 5:50–59.) The metering unit is vacuum operated, and draws seeds against the disk as it rotates. (*Id.*, 1:14–29; Ex.1003 ¶75.)

ii. “a sowing disc which is rotated by a motor-driven transmission drive shaft at controlled speed,”

VenHuizen discloses a “metering unit which retains a circular rotatable seed disk that separates the interior of the metering unit into two chambers, one on each

side of the disk.” (Ex.1006, 1:13–17.) VenHuizen also discloses a gearing assembly connected to the wheels that rotates a drive member on the inner shaft of the metering unit: “A gearing assembly, not shown, connected to the wheels 26 rotates a drive member, also not shown, which rotates a shaft 42 that extends through the metering unit and drives the metering unit 36 such that the rate at which the metering unit discharges seed is coordinated to the ground speed of the planter 10.” (*Id.*, 5:44–59.) “Rotating the retaining hub 56 clockwise with respect to the drive shaft moves a seed disk 60 retained thereon....” (*Id.*, 6:11–13.) A motor in the system causes the drive wheels of the tractor and precision planter to rotate. This, in turn, transmits torque to cause the shaft and singling discs to rotate. Therefore, VenHuizen discloses a motor-driven transmission. The drive shaft is on the fixed portion of the housing and centered relative to the sowing disc, and therefore constitutes a transmission drive shaft. The sowing disc is rotated at a controlled speed which is coordinated to the ground speed of the planter. (*Id.*, 5:44–59.) Figure 7 of VenHuizen is annotated below identifying these disclosed features. (Ex.1003 ¶76.)

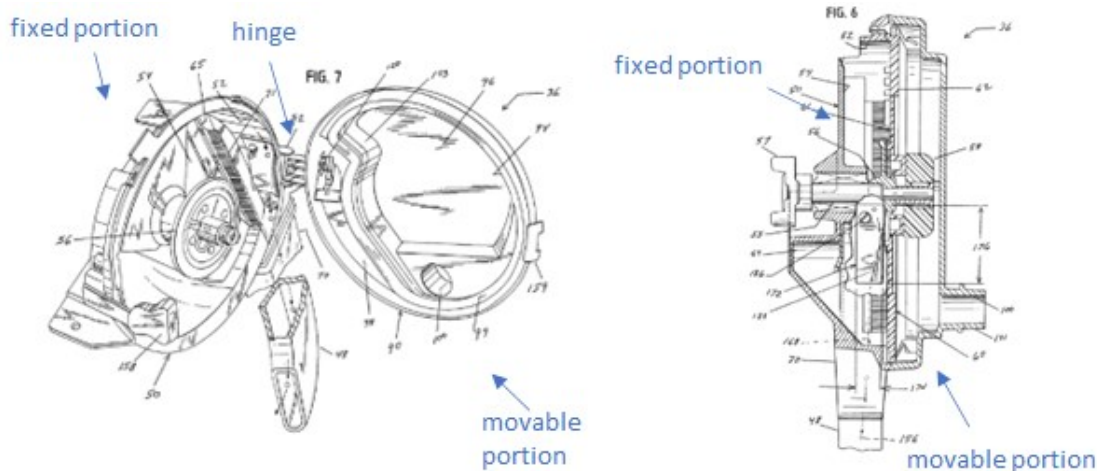


iii. “a housing with a fixed portion and a portion which is movable relative to the fixed portion and can be closed against the fixed portion,”

VenHuizen discloses a housing with a first member (fixed portion) and a second housing member (movable portion) attached by a pivot pin to the first housing member: “the metering unit 36 includes a first housing member 50, having a generally cylindrical outer wall 52 and a planar rear wall 54 thereby forming a cavity” (Ex.1006, 5:59–62), “the metering unit 36 includes a second housing member 90 attached by a pivot pin 92 to the first housing member 50.” (*Id.*, 7:19–21.) Figures 6 and 7 of VenHuizen are annotated below identifying these disclosed features. (Ex.1003 ¶¶77–78.)

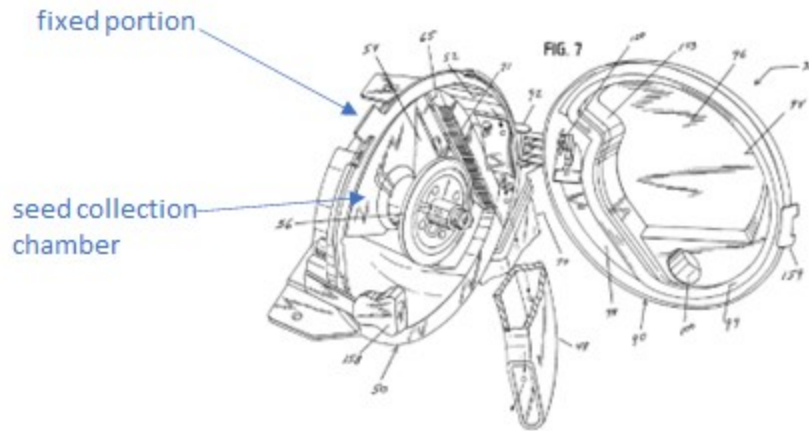
The first member of VenHuizen is the fixed portion because it communicates with the seed hopper containing seeds to be planted. (*Id.*, ¶78.) Further, the John Deere manual for the planter referenced in VenHuizen (*Id.*, 1:38–45) shows and

describes the first member as the fixed portion of the seed meter housing.
(Ex.1016 at 63 (35-10), 262 (125-16); Ex.1003 ¶79.)



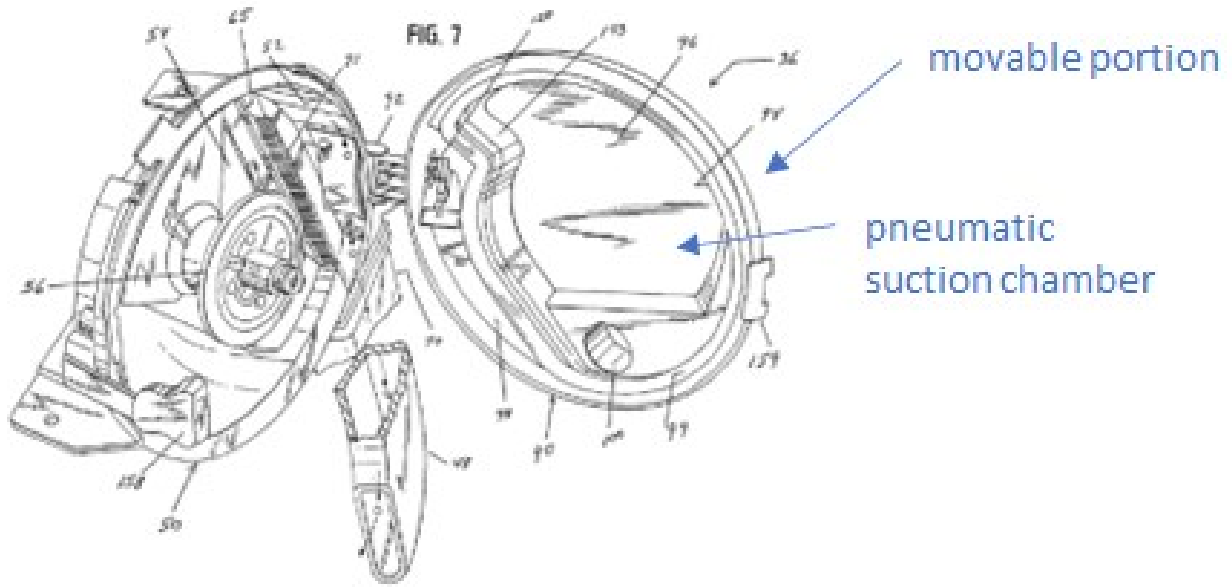
iv. “a seed collection chamber being defined in the fixed portion,”

VenHuizen discloses “the first housing 50 includes an upwardly opening access port 69 in the rear wall 52 into which the lower end of the chute from the hopper 32 extends, allowing seeds to enter the first housing member 50.” (Ex.1006, 6:37–41.) “A vacuum is drawn in the chamber formed on one side of the disk and seeds are introduced into the chamber on the opposite side of the disk.” (*Id.*, 1:20–22.) “[W]herein seed is introduced into a first cavity in the metering unit defined by a first surface of the seed disk and a vacuum is drawn in a second cavity defined by the second surface of the seed disk.” (*Id.*, 3:14–16; Ex.1003 ¶80.) See below annotated Figure 7 of VenHuizen:



v. “a pneumatic suction chamber being defined in the movable portion,”

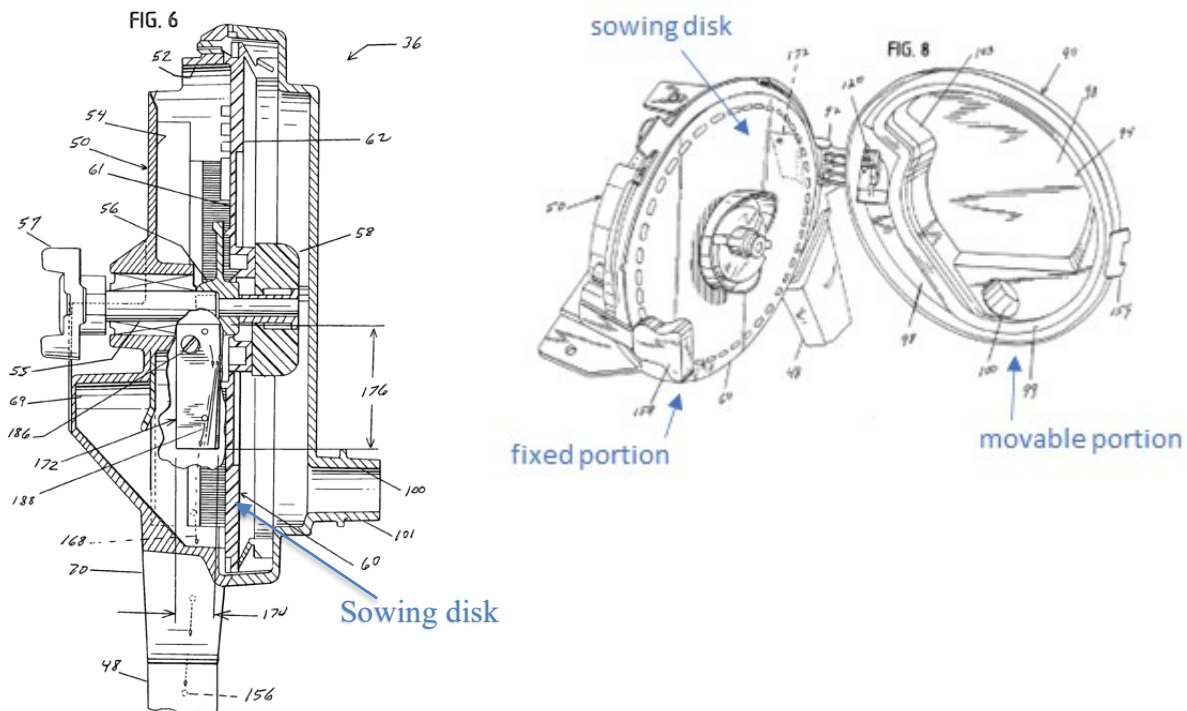
VenHuizen discloses: “The second housing member 90 further has an aperture 100 in the rear wall 96 and the outer surface of the second housing member has a tubular protrusion 101 the inner opening of which communicates with the aperture 100 and is adapted to receive a vacuum hose, not shown, leading from a vacuum pump.” (Ex.1006, 7:31–36.) “A vacuum is drawn in the chamber formed on one side of the disk and seeds are introduced into the chamber formed on the opposite side of the disk.” (*Id.*, 1:20–22, Fig. 7 annotated below; Ex.1003 ¶81.)



- vi. **“the sowing disc being interposed between the fixed and movable portions and having opposed surfaces delimiting the chambers,”**

VenHuizen discloses a seed disk (sowing disc) interposed between the fixed and movable portions: “A vacuum is drawn in the chamber formed on one side of the disk and seeds are introduced into the chamber formed on the opposite side of the disk.” (Ex.1006, 1:20–22.) “[T]he seed disk 60 has a generally circular body with first and second planar surfaces 61, 62...” (*Id.*, 6:19–21.) “Extending around a circle which is spaced a short distance within the outer circumference of the seed disk 60 are a plurality of spaced transverse holes 67–67.” (*Id.*, 6:27–30.) “During operation, seeds are drawn by the vacuum against the holes at the outer circumference of the rotating seed disk where they are retained as the disk moves through an arc that carries the seeds to a position above the seed chute and the seed tube. As the seeds

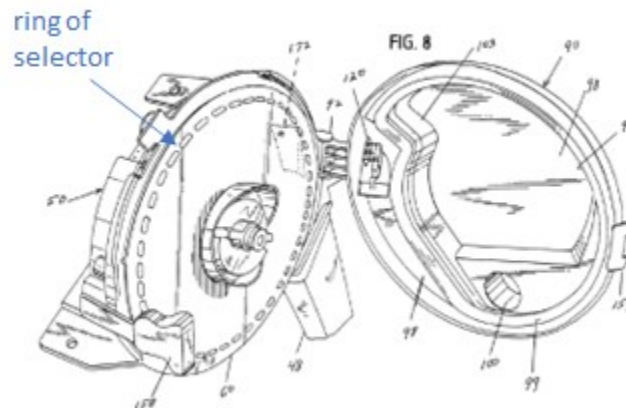
reach a position above the seed chute, the disk moves away from the vacuum and the seeds fall away from the disk....” (*Id.*, 3:33–39.) Opposed surfaces of the sowing disk, together with the respective movable or fixed portion, delimit the chambers of the seed meter. (Ex.1006, Figs. 6, 8 annotated below; Ex.1003 ¶82.)

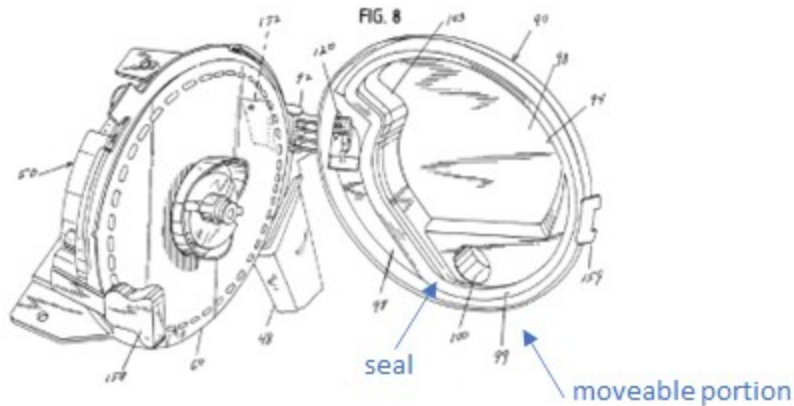


- vii. “the sowing disk having at least one ring of selector holes extending between the opposed surfaces, and”

VenHuizen discloses: “the seed disks employed in the machine have a plurality of holes, with the centers thereof spaced to define a circle having a radius a little less than the radius of the disk.” (Ex.1006, 1:17–20.) “Extending around a circle which is spaced a short distance within the outer circumference of the seed

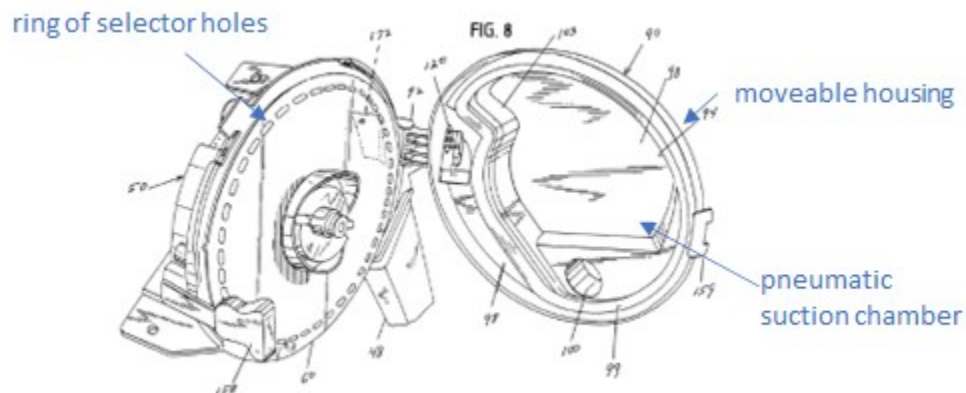
disk 60 are a plurality of spaced transverse holes 67–67.” (*Id.*, 6:27–31, Fig. 8 annotated below; Ex.1003 ¶83.)





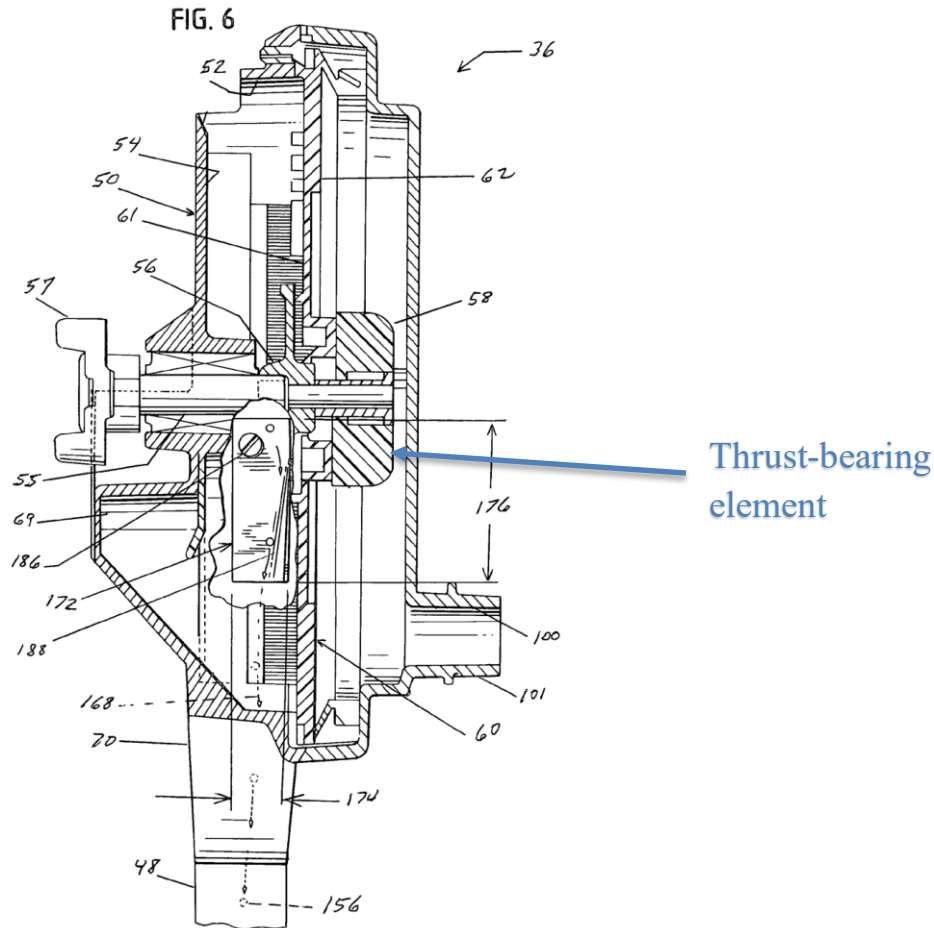
ix. **“wherein a pressure differential is provided between the opposed surfaces in the region of a circumferential segment of the ring of holes,”**

VenHuizen discloses: “When the metering unit 36 is operating properly, the vacuum in the second chamber is drawn through the plurality of holes 67–67 of the seed disk 60 except for those holes 67–67 positioned beyond the sealing member 99 (defined by the intrusion portion 98).” (Ex.1006, 7:64–8:1.) Further, “[a]s the disk 60 rotates through the mass of seeds 156 which accumulate near the port 69, one seed is drawn by the vacuum against each of the transverse holes 67–67.” (*Id.*, 8:5–8, Fig. 8 annotated below; Ex.1003 ¶85.)



x. “wherein the seed distribution element further comprises a thrust-bearing element of the sowing disc,”

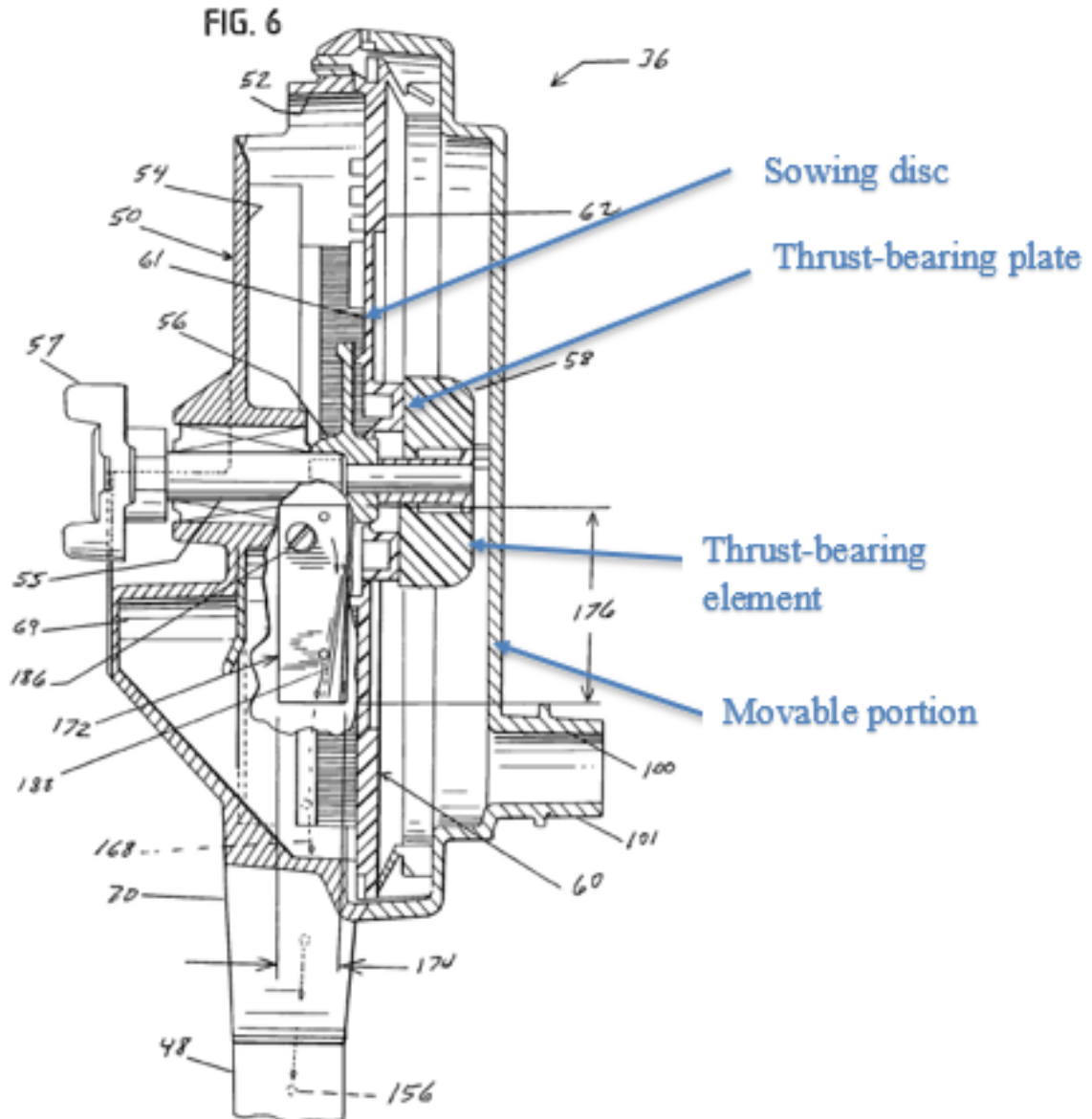
VenHuizen teaches a hub handle for locking the seed disk on the hub: “Extending from the rear wall 54, axially with respect to the cylindrical outer wall 52, is a tubular retaining hub 56 at the distal end of which is a handle 58 which is rotatable between a first position for receiving or 65 removing a seed disk 60 and a second position for removably retaining a seed disk 60 on the hub 56.” (Ex.1006, 5:62–67.) Further, “the seed disk 60 has a generally circular body with first and second planar surfaces 61, 62, and having a wing shaped central opening 53. The opening 53 is shaped to receive the winged hub handle 58, not shown, at the distal end of the retaining hub 56 of first housing member 50. Surrounding the central opening 53 on the second side 62 are two arcuately shaped opposing ramped surfaces 63, 64 and opposing locking notches 65, 66 for locking the seed disk 60 to the hub 56” (*Id.*, 6:20–28, Fig. 6 annotated below; Ex.1003 ¶85.) This hub handle, which constrains the movement of the seed disk when a vacuum is applied, constitutes a thrust-bearing element. (Ex.1003 ¶86.)



- xi. “which thrust-bearing element is supported rotatably in the movable portion in order to withstand at least some of the axial load produced by the disc on the seal.”**

As shown in Figure 6 of VenHuizen, when the movable portion of the housing is closed onto the fixed portion, the hub-mounted handle (*i.e.* thrust-bearing element) is positioned within the movable portion of the housing. Furthermore, VenHuizen discloses that the hub is threaded onto the cylindrical drive shaft and the handle is at the distal end of the retaining hub. “Extending from the rear wall 54, axially with

respect to the cylindrical outer wall 52, is a tubular retaining hub 56 at the distal end of which is a handle” (Ex.1006, 5:62–64.) “[T]he retaining hub 56 is threaded on a cylindrical drive shaft 55 at the distal end of which are a pair of flanges 57 for drivingly engaging a drive member” (Ex.1006, 6:1–4, Fig. 6 annotated below.) The hub handle, which is locked to the hub, is therefore rotatably mounted and retains the disk against the vacuum. (Ex.1003 ¶87.)



- b. **Claim 2: “The seed distribution element according to claim 1, wherein the thrust-bearing element is rotated with the disc when the fixed and movable portions are closed against one another.”**

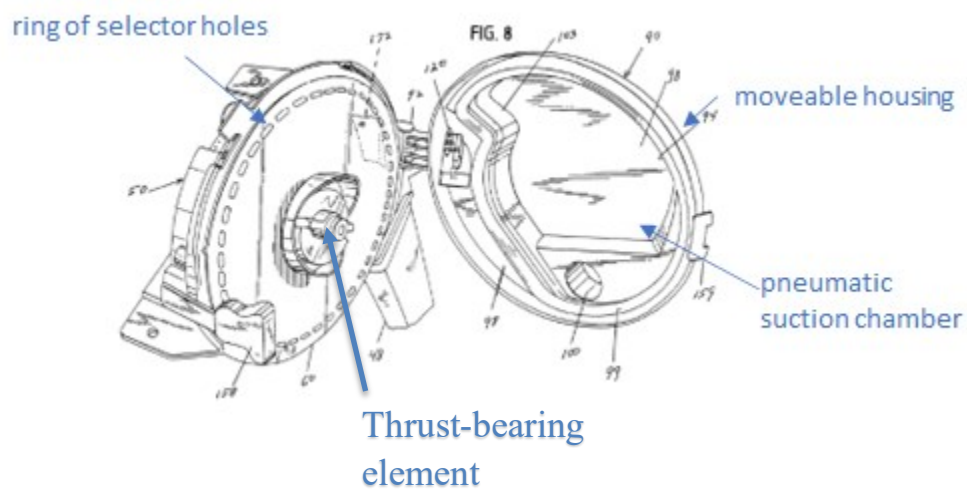
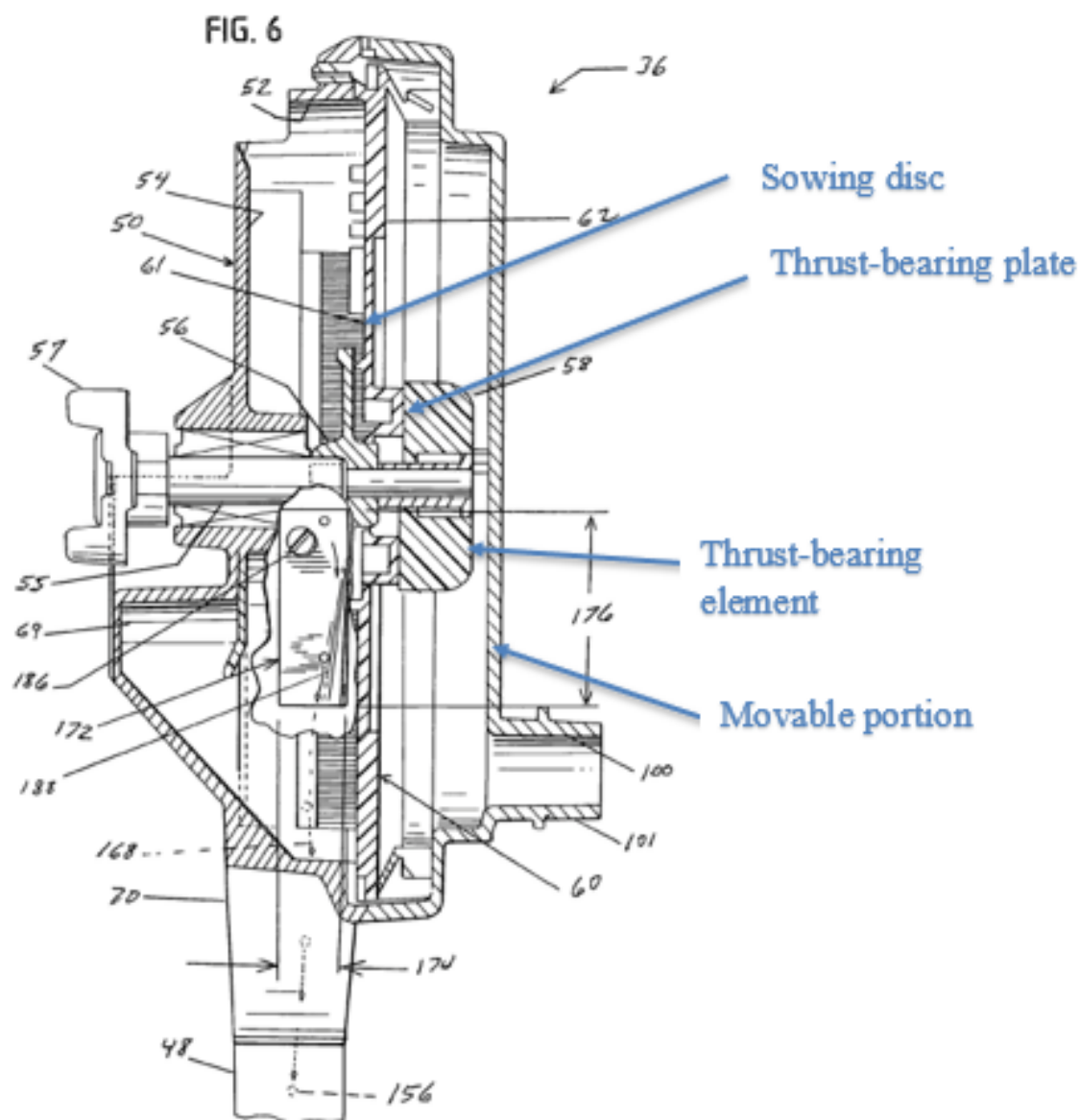
The seed disk of VenHuizen is locked in place on the hub via the hub handle.

Together, the hub, hub handle (thrust-bearing element) and seed disk rotate when

the fixed and movable portions are closed together. In particular, the seed distribution element of VenHuizen comprises a thrust-bearing element (the hub handle 58), which is attached to the distal edge of a retaining hub 56, itself connected to the drive shaft 55. (Ex.1006, 6:1–18, 22–27, Fig. 6; Ex.1003 ¶121.) Thus, as the hub handle is attached to the retaining hub, rotation of the hub by the driving mechanism rotates the disc, which also rotates the hub handle 58. (*Id.*, 6:1–19, Fig. 7; Ex.1003 ¶121.)

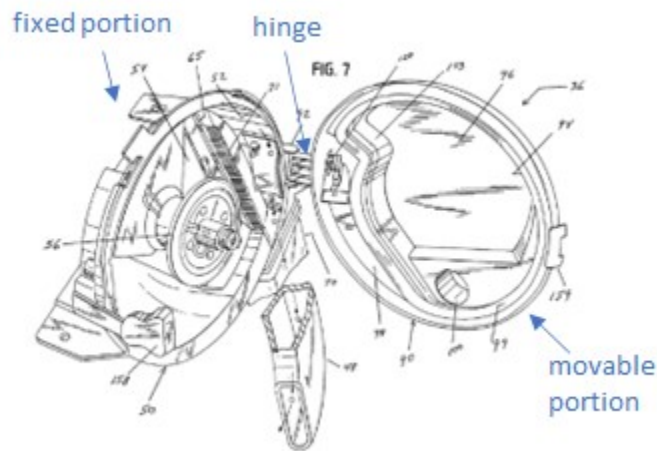
- c. Claim 3: “The seed distribution element according to claim 1, wherein the thrust-bearing element comprises a thrust-bearing plate which can bear on that surface of the sowing disc which faces the seal, in a zone radially inside of the ring of holes.”**

The thrust-bearing element of VenHuizen includes a plate which bears on the surface of the sowing disc facing the seal. Notably, as shown in the figure below, the hub handle 58 includes a generally flat surface on the left side that contacts the sowing disc 60 to constrain its axial movement. (Ex.1006, 6:1–18, 22–27, Fig. 6; Ex.1003 ¶127.) That surface 62 of the sowing disc touched by the handle 58, of course is located on the same side of the sowing disc as the seal. Furthermore, as seen in figure 6, annotated below, the hub handle 58 contacts the surface 61 of the disc radially inside the ring of selector holes. (Ex.1003 ¶127.)



- d. **Claim 7: “The seed distribution element according to claim 1, wherein the movable portion is hinged to the fixed portion.”**

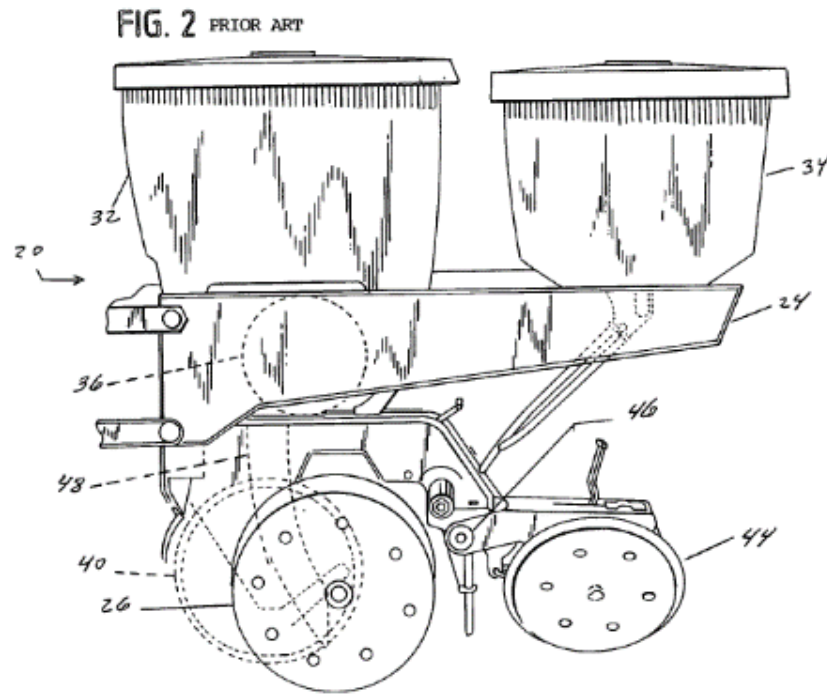
VenHuizen discloses the second housing member (movable portion) being attached to the first housing member (fixed portion) via a pivot pin (hinge): “the metering unit 36 includes a second housing member 90 attached by a pivot pin 92 to the first housing member 50.” (Ex.1006, 7:19–21.)



- e. **Claim 8: “a sowing element for precision seed drills comprising a frame on which a seed distribution element according to claim 1 is mounted.”**

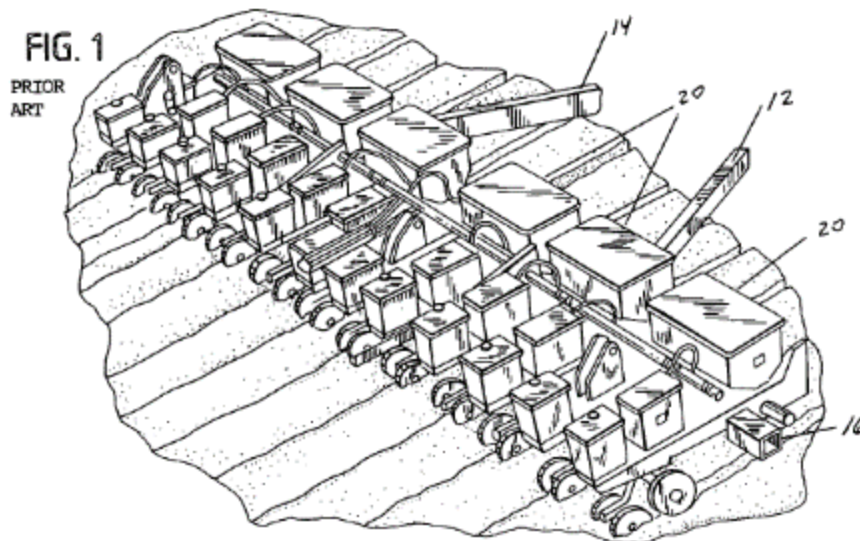
VenHuizen discloses a frame 24 with the row unit 20 thereon: “each row unit 20 has a frame 24 supported by a pair of spaced apart wheels ... Mounted above the frame 24 are a first hopper 32 for retaining seed and a second hopper 34 for retaining a dry herbicide. Below the seed hopper 32 is a metering unit 36....” (Ex.1006, 5:26–

33; Fig. 2.) Of course, the metering unit is the seed distribution element disclosed with respect to claim 1. (Ex.1003 ¶¶144.)



f. **Claim 9: “A seed drill comprising a support structure on which a plurality of sowing elements according to claim 8 are mounted.”**

VenHuizen discloses a plurality of row units, stating that each row unit has a frame with a metering unit: “Extending along the length of the cross bar 14 are a plurality of row units 30–30” (Ex.1006, 5:17–18; Fig. 1.) A plurality of the sowing elements disclosed above in claim 9 are disclosed. (Ex.1003 ¶150.)



g. Claims 10–12 and 16

Independent claim 10’s scope is nearly identical to independent claim 1 except claim 10 recites the structure of the movable portion of the housing being a pre-assembled kit with the thrust-bearing element. *See supra*, VIII.A.1.(a–f). Dependent claims 11, 12, and 16 refer back to the dependent claim elements of claims 2, 3, and 7, respectively, using the following language: “The kit according to claim 10 wherein the movable portion and the thrust-bearing element comprise at least one feature according to claim [2, 3, 7].”³ (*See Ex.1001, 6:7–13, 21–25.*)

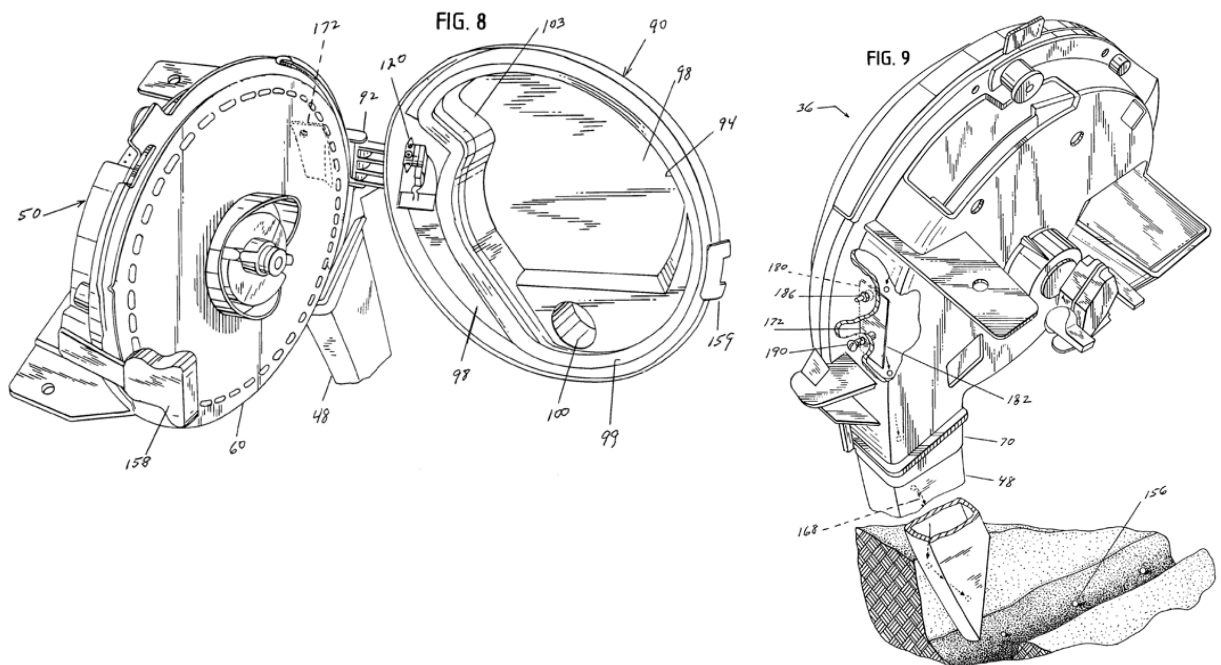
VenHuizen discloses “a kit that includes an improved seed disk for insertion into the metering unit of a John Deere planter” to improve efficiency of planting

³ While claims 11, 12, and 16 appear to suffer §112 frailties, Precision assumes for purposes of this proceeding that each claim requires *all* elements of the dependent claim it references.

seeds and further describes machines “fitted with the parts described” in another patent enjoy reliable planting. (Ex.1006, 2:32–40.) VenHuizen’s express disclosure of a “kit” and machines “fitted with the parts” (in particular in reference to a pre-existing John Deere planter) is a quintessential mechanism by which farmers have for decades used to improve their machinery to enjoy advances in technology to update or repair the functionality of their pre-existing equipment. (Ex.1003 ¶157.) Using such “kits” or “fit[ing] machines with the parts described” constitutes a “retrofit,” that is, using an old machine with new parts. (*Id.*) Since VenHuizen expressly discloses “kits” and does not describe whether the seed meter 36 of VenHuizen must be installed on a new or existing planter, a POSA would understand VenHuizen discloses the potential to use the *entire seed meter* described and shown in VenHuizen as a retrofit kit to use on existing planters. (*Id.*) There is nothing about the seed distribution element disclosed in VenHuizen that would make it incompatible for retrofit applications. (*Id.*) Moreover, when the entire seed distribution element of VenHuizen is pre-assembled, as is shown in various figures thereof, the movable portion would also be pre-assembled with the thrust-bearing element and mountable with available bolt-holes found on the fixed side of the unit. (*Id.*, ¶169.) For example, figure 8 of VenHuizen constitutes the pre-assembled unit shown in an open state that, when closed (Ex.1006, Fig. 6 or Fig. 9), constitutes the

claimed movable portion of the housing being a pre-assembled kit with the thrust-bearing element. (Ex.1003 ¶169; *see also* Ex.1006, Figs. 8–9 depicted below.)

Since VenHuizen includes all claimed elements of claims 1, 2, 3, and 7, as established above, VenHuizen also discloses the “kit” elements comprising “the movable portion pre-assembled with: a thrust-bearing element of the sowing disc, which thrust-bearing element is supported rotatably in the movable portion in order to withstand at least some of the axial load produced by the disc on the seal” of claim 10, as well as the dependent claim elements of claims 11, 12, and 16.



2. Ground 2: Fiorido anticipates claims 1–5 and 10–14

a. Claim 1

i. “A seed distribution element for precision pneumatic seed drills, comprising:”

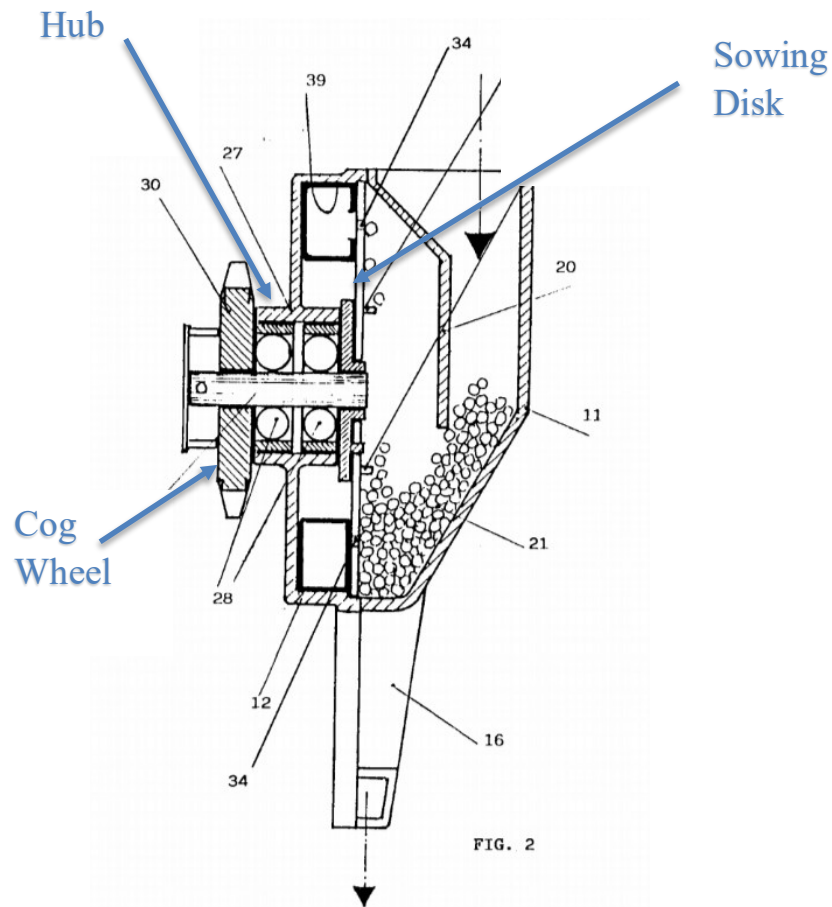
Fiorido discloses: “The present invention relates to precision-type single-seed drilling planters....” (Ex.1007, 1:1–2.) Fiorido also discusses the employment of air suction across perforations (*Id.*, Abstract.) Thus, Fiorido is directed to a seed distribution element for precision pneumatic seed drills. (Ex.1003 ¶89.)

ii. “a sowing disc which is rotated by a motor-driven transmission drive shaft at controlled speed,”

Fiorido discloses a perforated disk (sowing disk) to which seeds adhere via air suction: “The seeds 21, owing to the air suction through the conduit 22, the hole 23, the slit 24 and the perforations 34, are caused to adhere to the disk 13 and are lifted off the same disk, and get progressively separated, as they proceed in front of the slots 37 of the selector element 14.” (Ex.1007, 7:29–34.) The perforated disk is supported by a shaft and is rotatably driven: “The casing 12 is also provided with a perforated hub 27 (Figure 2) through which passes, as supported by bearings 28, a shaft 29 that may for instance be driven through a cog-wheel 30 to rotatably drive the disk 13, to which it is connected by means of a driving disk 31, a centering dowel 32 and a driving pin 33.” (*Id.*, 5:49–55.) The driveshaft is on the fixed portion of the

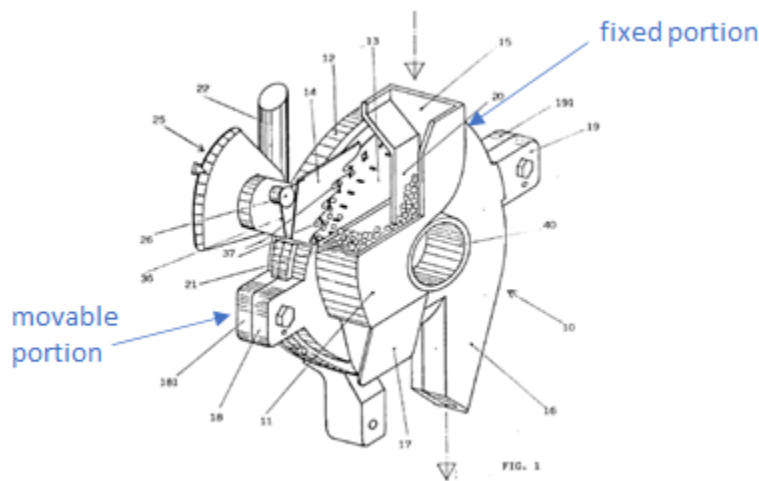
housing and centered relative to the sowing disc, and therefore constitutes a transmission drive shaft. (Ex.1003 ¶¶90.)

Fiorido discloses a cog-wheel as an example of a means to rotate the perforated disk. (Ex.1007, 5:49–55.) A POSA understands that a cog-wheel could be driven by a motor either directly or indirectly, as a means for the cog-wheel to rotate to operate the seed disk 13. (Ex.1003 ¶¶91.) Thus, Fiorido discloses a motor-driven transmission to rotate the perforated disk.



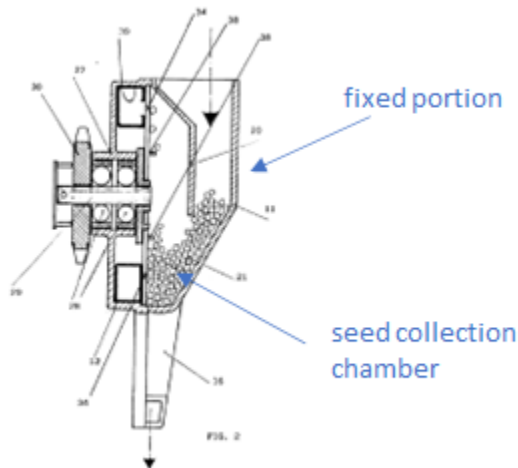
iii. “a housing with a fixed portion and a portion which is movable relative to the fixed portion and can be closed against the fixed portion,”

Fiorido discloses a box-like casing (housing) with two portions. The second portion is movable relative to the first and can be closed against the first by means of pins or bolts: “The single-seed distributor means 10 is essentially formed by a seed container 11 and a box-like casing 12, with a perforated disk 13, associated with selector element 14, arranged therebetween.” (Ex.1007, 5:10–13.) “Said seed container 11 is further provided with projections 18, 19 that are adapted to cooperate with respective projections 181 and 191 of the casing 12 to effect the connection and the closure (by means of holes, pins, and bolts) of the container 11 with casing 12.” (*Id.*, 5:22–27; Ex.1003 ¶92.)



iv. “a seed collection chamber being defined in the fixed portion,”

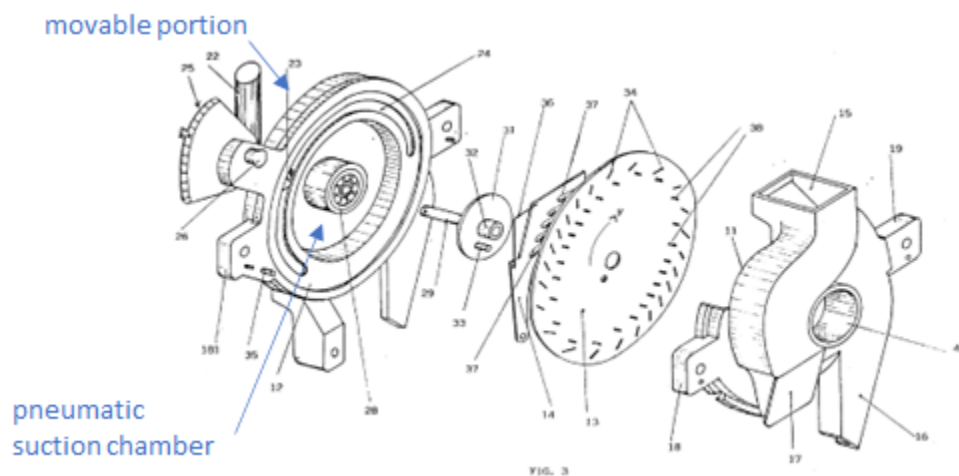
Fiorido discloses a seed container in the fixed portion connected to the hopper for loading seeds: “The seed container 11 is provided on its upper portion with a hopper 15 for loading the seeds, and on its lower portion with an unloading conduit 16 for depositing the seeds into the ground...” (Ex.1007, 5:14–16; Ex.1003 ¶93.) Figure 2 of Fiorido, annotated below, shows the seeds in the seed collection chamber:



v. “a pneumatic suction chamber being defined in the movable portion,”

Fiorido discloses: “The box-like casing 12 is connected with an air suction device (for instance, a motor-driven fan of known type, not shown in the Figure) through a suction conduit 22 which terminates in a hole 23 (Figure 3) in correspondence of a suction slit 24 that is provided along a circumferential arc in the body of the casing 12.” (Ex.1007, 5:33–39.) To the extent it is argued that the seed

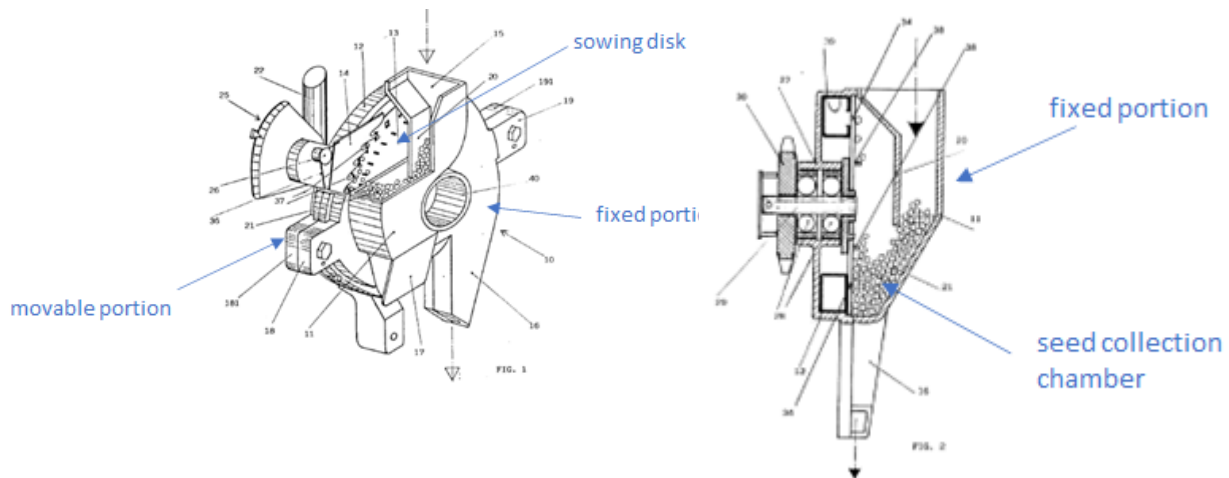
collection chamber is not defined in the fixed portion and the suction chamber is not defined in the movable portion, Fiorido teaches a POSA that the fixed and movable sides may be swapped because the motor-driven transmission drive shaft can be introduced on either side. Further, as admitted in the '121 patent, a POSA knows the seal's thrust-bearing must be on the suction side to alleviate axial load on the seal. (Ex.1001, 1:53–55, 63–65; Ex.1003 ¶¶94.) Consequently, Fiorido discloses either the seed or suction chamber may be on the fixed side and the function of the thrust-bearing dictates it be on the suction side. (Ex.1003 ¶¶94.)



- vi. **“the sowing disc being interposed between the fixed and movable portions and having opposed surfaces delimiting the chambers,”**

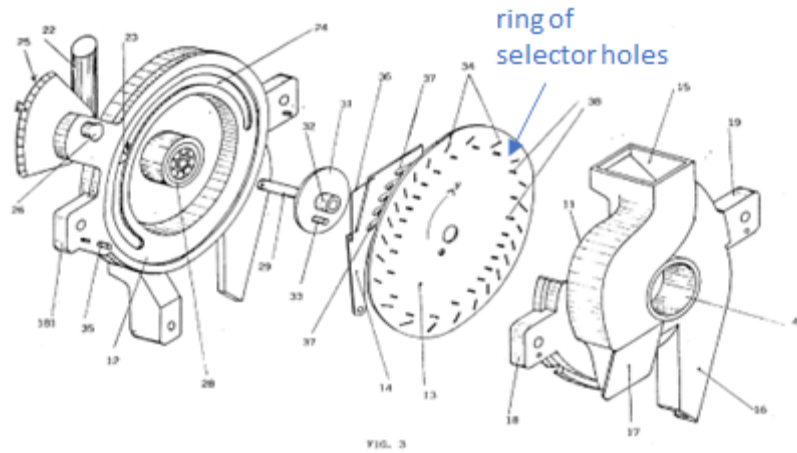
Fiorido discloses a perforated sowing disk being located between the fixed seed container and movable box-like casing: “The single-seed distributor means 10 is essentially formed by a seed container 11 and a box-like casing 12, with a

perforated disk 13, associated with selector element 14, arranged therebetween.” (Ex.1007, 5:10–13; Ex.1003 ¶95.) Opposing sides of the disk present surfaces of the seed disk to delimit the seed collection and pneumatic suction chambers corresponding with the fixed and movable portions, respectively, as annotated in figures 1 and 2 below:



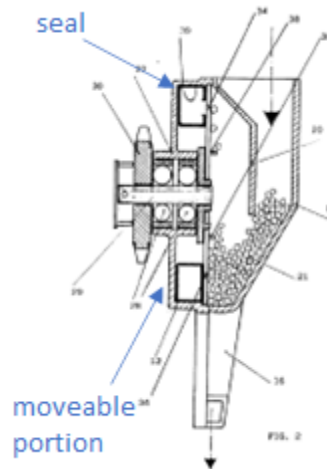
vii. “the sowing disc having at least one ring of selector holes extending between the opposed surfaces, and”

Fiorido discloses: “the withdrawal of the seeds from the loading container, their separation and their distribution according to a one-by-one pattern are performed by means of a *rotating perforated disk having one or more sequences of concentric circular perforations*, and co-operating on one side with a suction blower, which creates a negative pressure of the air through the perforations of the disk and thereby keeps the seeds adhering to the disk until the unloading zone is reached....” (Ex.1007, 1:25–37, emphasis added, Fig. 3 annotated below; Ex.1003 ¶96.)



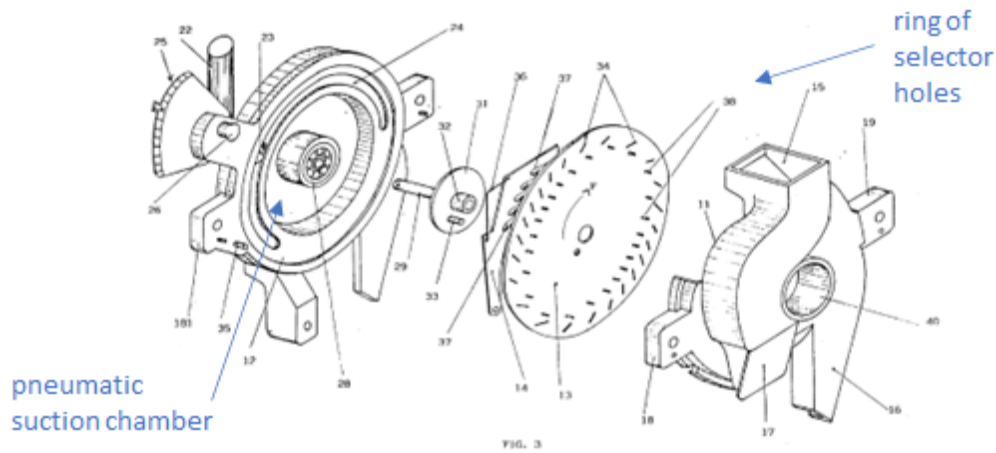
- viii. **“a seal which is arranged on the movable portion and is capable of sliding contact with the facing surface of the disk when the fixed and movable portions are closed against one another,”**

Fiorido discloses a hollow sealing ring arranged on the movable portion between the casing (movable portion) and the disk. (Ex.1007, 7:53–59; Fig. 2 annotated below.) When the case is closed, the seal would necessarily be in sliding contact with the rotating disk to maintain the seal when the two portions of the housing were closed together and the disk rotates in operation. (Ex.1003 ¶97; Ex.1007, 7:25–34; 7:53–59.)



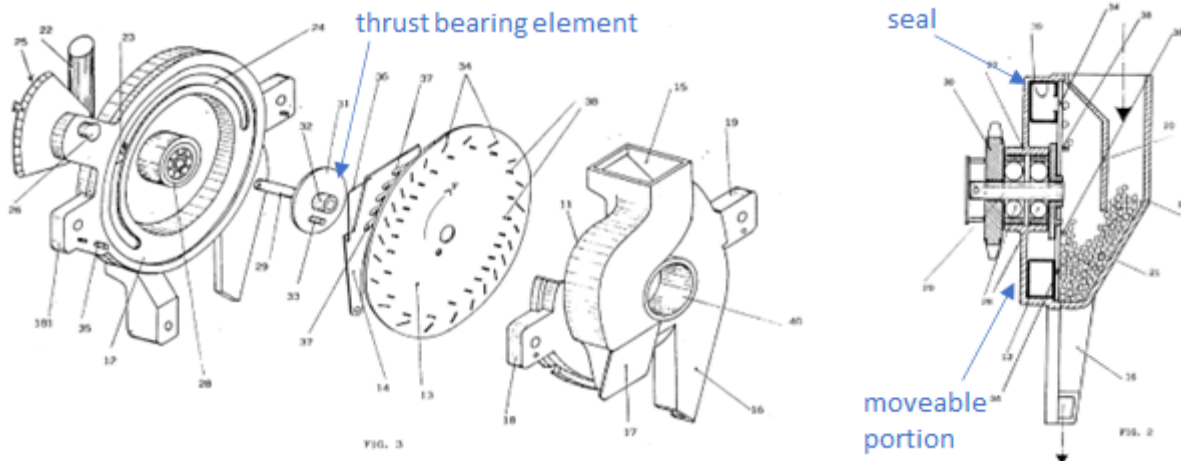
ix. “wherein a pressure differential is provided between the opposed surfaces in the region of a circumferential segment of the ring of holes,”

Fiorido discloses: “the withdrawal of the seeds from the loading container, their separation and their distribution according to a one-by-one pattern are performed by means of a rotating perforated disk having one or more sequences of concentric circular perforations, and co-operating on one side with a suction blower, which creates a negative pressure of the air through the perforations of the disk and thereby keeps the seeds adhering to the disk until the unloading zone is reached....” (Ex.1007, 1:25–37; Ex.1003 ¶98.) As shown in figure 3, annotated below, the pressure differential is established along a circumferential segment of the ring of holes adjacent the opening in the seal. (*See also* Ex.1007, 7:40–45 (discussing how seeds unload when no longer subjected to air suction).)



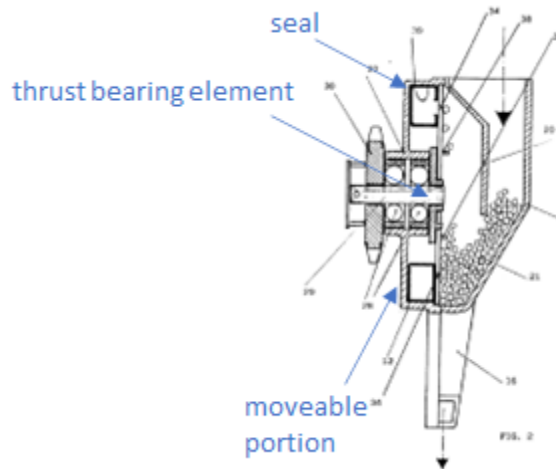
x. “wherein the seed distribution element further comprises a thrust-bearing element of the sowing disc,”

Fiorido teaches a shaft supported by bearings that is connected to a driving disk, a centering dowel, and a pin: “The casing 12 is also provided with a perforated hub 27 (Figure 2) through which passes, as supported by bearings 28, a shaft 29 that may for instance be driven through a cog-wheel 30 to rotatably drive the disk 13, to which it is connected by means of a driving disk 31, a centering dowel 32 and a driving pin 33.” (Ex.1007, 5:49–55, Figs. 2–3 annotated below.) The driving disk mounts against the perforated disk constraining the movement of the disk in the axial direction when a vacuum is applied by in the pneumatic suction chamber. This constitutes a thrust-bearing element. (Ex.1003 ¶¶99.)



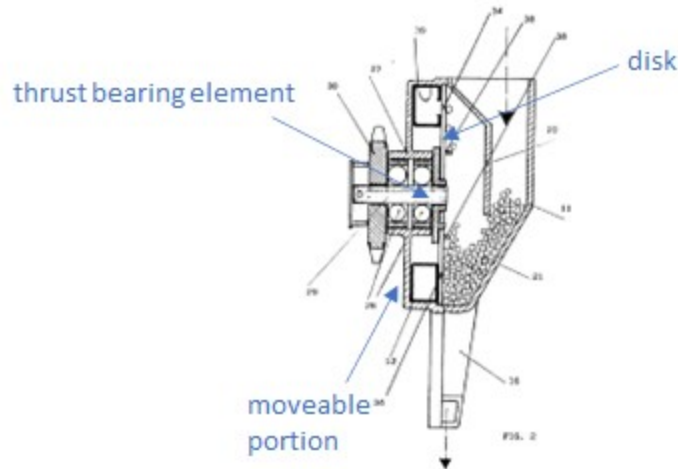
- xi. “which thrust-bearing element is supported rotatably in the movable portion in order to withstand at least some of the axial load produced by the disc on the seal.”**

Fiorido’s shaft, bearings, and driving disk are rotatably supported by bearings in the casing (movable portion of the housing). (Ex.1007, Fig. 2 annotated below.) The driving disk mounts against the perforated disk constraining the movement of the disk in the axial direction and withstanding some of the load applied to the disk by the seal when a vacuum is applied. To the extent it is argued that the thrust-bearing element is not mounted in the movable portion, for the reasons discussed above Fiorido expressly discloses this alternative. (Ex.1003 ¶100.)



- b. **Claim 2: “The seed distribution element according to claim 1, wherein the thrust-bearing element is rotated with the disc when the fixed and movable portions are closed against one another.”**

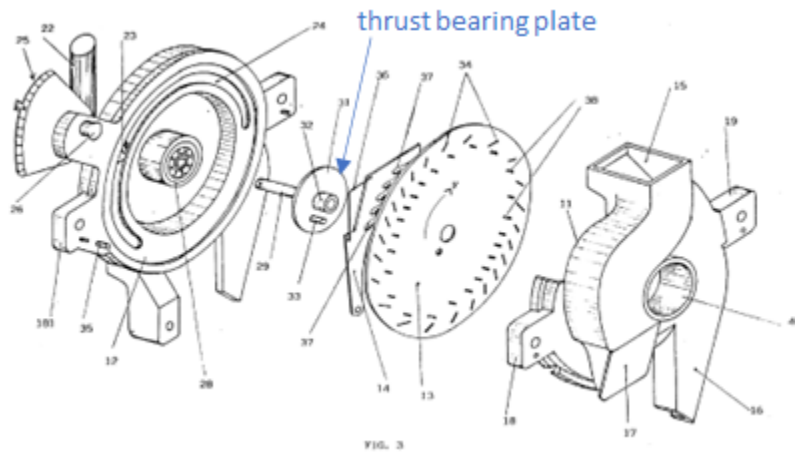
The driving disk (“thrust-bearing element”) of Fiorido is connected to the seed disk by means of a shaft, centering dowel, and pin. The shaft is supported by bearings and driven by means of a cog wheel (for instance). “The casing 12 is also provided with a perforated hub 27 (Figure 2) through which passes, as supported by bearings 28, a shaft 29 that may for instance be driven through a cog-wheel 30 to rotatably drive the disk 13, to which it is connected by means of a driving disk 31, a centering dowel 32 and a driving pin 33.” (Ex.1007, 5:49–55, Fig. 2 annotated below.) The pin couples the driving disk in rotation with the seed disk. Thus, the thrust-bearing element is rotated with the disk when the fixed and movable portions are closed against one another. (Ex.1003 ¶122.)



- c. **Claim 3: “The seed distribution element according to claim 1, wherein the thrust-bearing element comprises a thrust-bearing plate which can bear on that surface of the sowing disc which faces the seal, in a zone radially inside of the ring of holes.”**

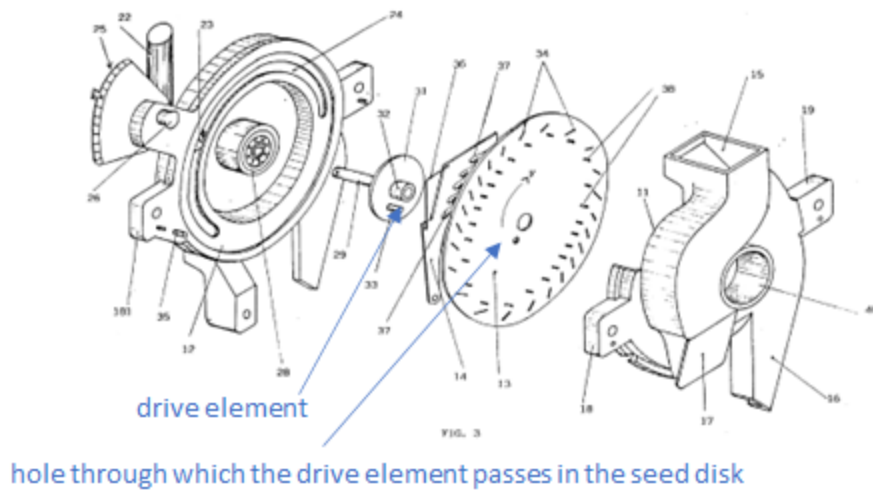
Fiorido discloses a driving disk 31 supported rotatably in the casing 12. The driving disk 31 is the thrust-bearing plate because it is generally flat and in the same shape as the thrust-bearing plate of the '121 patent's preferred embodiment and presents a surface against which the sowing disc touches and constrains the sowing disc's axial load against the seal. The driving disk 31 is located between the disk 13 and the casing 12, the suction in suction slit 24 would at least partially pull the disk 13 toward the driving disk 31 such that the driving disk withstands at least some of the axial load produced by the disk 13 on the seal 39. (Ex.1007, Fig. 3 annotated below.) Figure 2 shows the driving disk 31 bearing on the surface of the perforated disk 13 on a surface that faces the seal 39, and the driving disc 31 is in a zone that is

radially inside of the holes or perforations formed through the perforated disk 13.
(Ex.1007, Figs. 2–3; Ex.1003 ¶128.)



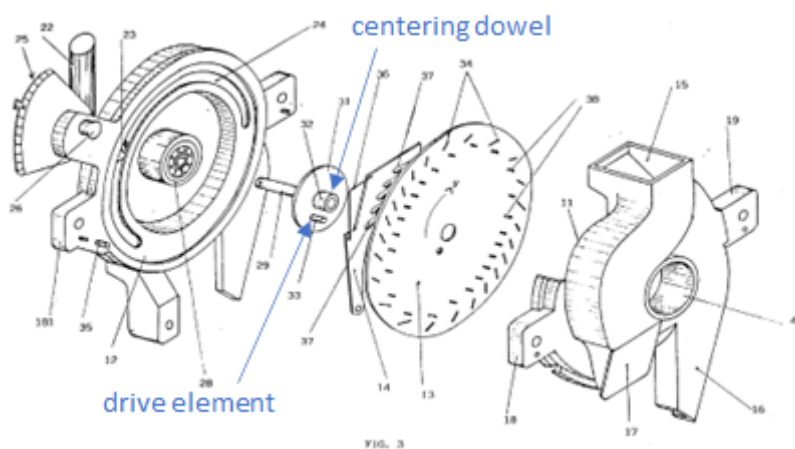
- d. **Claim 4: “the seed distribution element according to claim 3, wherein the thrust-bearing element comprises a drive element which is fixed for rotation with the plate and can be coupled with the drive shaft of the disc when the fixed and movable portions are closed against one another.”**

Fiorido discloses a driving disc 31, which constitutes a plate, that further includes a driving pin 33 and a center dowel 32 through which the driving disc 31 attaches to the seed disc (*i.e.*, perforated disc 13) and rotatably drives the seed disc along with the driving disc 31 to which the driving pin and center dowel are affixed. (Ex.1007, 5:49–55, Fig. 2, Fig. 3 annotated below.) The driving pin is a “drive element” which is fixed for rotation with the plate (*i.e.*, the driving disc 31) and is coupled with the drive shaft of the disc (*i.e.*, through the driving disc) when the fixed and movable portions are closed against one another, as in claim 4. (Ex.1003 ¶131.)



- e. **Claim 5: “The seed distribution element according to claim 4, wherein the drive element is self-centring relative to the drive shaft.”**

The rotational center of the drive element (driving pin 33) disclosed in Fiorido is coaxial with the rotational axis of the drive shaft. (Ex.1007, Fig. 3 annotated below; Ex.1003 ¶133.) Therefore, the drive element is self-centered with respect to the drive shaft.



f. Claims 10–14

Independent claim 10’s scope is nearly identical to independent claim 1 except claim 10 recites the structure of the movable portion of the housing being a pre-assembled kit with the thrust-bearing element. *See supra*, VIII.A.2.(a–e). Dependent claims 11–14 refer back to the dependent claim elements of claims 2–5, respectively using the following language: “The kit according to claim 10 wherein the movable portion and the thrust-bearing element comprise at least one feature according to claim [2, 3–5].” (*See Ex.1001*, 6:7–13.)

Fiorido discloses its “single-seed distributor means 10 according to the invention can be applied to any known type of planters (not shown) whatsoever.” (*Ex.1007*, 5:7–9.) Thus, Fiorido discloses its single-seed distributor means 10, the seed meter itself, is a kit for retrofitting planters to enjoy the full benefits of the invention disclosed and claimed in Fiorido, which is a quintessential mechanism by which farmers have for decades used to improve their machinery to enjoy advances in technology to update or repair the functionality of their pre-existing equipment. Using such kits constitutes a “retrofit,” that is, using an old machine with new parts. Since Fiorido expressly discloses its distributor can be applied to any known type of planter, and does not describe whether the distributor of Fiorido must be installed on a new or existing planter, a POSA would understand Fiorido discloses the potential to use the *entire seed meter* described and shown in Fiorido as a retrofit kit to use on

existing planters. There is nothing about the seed distribution element disclosed in Fiorido that would make it incompatible for use with retrofit applications. Moreover, when the distributor of Fiorido is pre-assembled, as is shown in various figures thereof, the movable portion would also be pre-assembled with the thrust-bearing element and mountable on a planter. For example, figures 1 and 2 of Fiorido constitute the pre-assembled unit, with the claimed movable portion of the housing being a pre-assembled kit with the thrust-bearing element. (Ex.1003 ¶¶172, 184.)

For the reasons discussed above with respect to claims 2–5, claims 11–14 are also anticipated by Fiorido. (Ex.1003 ¶¶120, 122, 126, 128, 130–133, 206, 208, 212, 214, 216–219.)

B. Obviousness

1. Ground 3: Fiorido combined with VenHuizen and Applicant Admitted Prior Art render obvious claims 1–5, 7–14, and 16.

Claims 1–5, 7–14, and 16 are obvious over the teachings of Fiorido in view of VenHuizen and AAPA. A determination of obviousness requires finding that a POSA (1) would have been motivated to combine or modify the teachings in the prior art and (2) would have had a reasonable expectation of success in doing so. *Adapt Pharma Operations Ltd. v. Teva Pharms. USA, Inc.*, 25 F.4th 1354, 1365 (Fed. Cir. 2022).

Claim 1 is obvious over Fiorido by itself. To the extent that Maschio argues that Fiorido does not disclose the combination of “a pneumatic suction chamber being defined in the movable portion” and “[a] thrust-bearing element is supported rotatably in the movable portion in order to withstand at least some of the axial load produced by the disc on the seal” as arranged in the claim, Fiorido’s disclosure teaches to modify Fiorido to arrive at this arrangement. As described above, Fiorido discloses that the drive element may be introduced into either side of the seed distributor housing. Further, a POSA would know that the vacuum chamber must be on the opposite side from the seed chamber. Therefore, if Fiorido’s drive element is moved from one side to the other, a POSA would know Fiorido’s thrust-bearing element must still be provided on the vacuum side to relieve axial load on the seal. A POSA would have a reasonable expectation of success in using the structures of Fiorido for the purpose disclosed by Fiorido. (Ex.1003 ¶¶93–94.)

Fiorido discloses each of the limitations of claims 2–5 for the reasons discussed above. (*Id.* ¶¶122, 128, 131, 133.)

Claims 7–9 are obvious over Fiorido in view of VenHuizen and AAPA. As shown above, VenHuizen discloses the limitation of hinging the fixed and movable portion to each other. VenHuizen also discloses to use the seed distribution element in combination with the frame of claim 8 and support structure of claim 9. (*Id.* ¶¶135–139, 145–147, 151–153.)

Claim 10 is obvious over Fiorido by itself for the reasons discussed above with respect to claim 1. (*Id.* ¶¶176–177.) Further, Fiorido discloses each of the limitations of claims 11–14 for the same reasons discussed above that it discloses each of the limitations of claims 2–5. (*Id.* ¶¶208, 214, 218, 220.) Finally, Fiorido in view of VenHuizen and AAPA render Claim 16 obvious for the same reasons as described above for claim 7. (*Id.* ¶¶223–226.)

2. Motivation to Combine

A POSA would have been motivated to modify Fiorido to add a hinge, mount Fiorido to a frame, and mount multiple units to a support structure. Both VenHuizen and Fiorido teach improved structures for use in seed drilling operations—VenHuizen teaches a “kit” for improving existing seed meters, and Fiorido expressly notes it can “be applied to any known type of planters (not shown) whatsoever”—and both have fixed and movable sides of a vacuum-operated seed meter housing. (Ex.1006, 2:32–40; Ex.1007, 5:7–9; Ex.1003 ¶¶157, 169.) These facts alone provide a motivation to combine VenHuizen and Fiorido. *See Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380 (Fed. Cir. 2023) (where prior art “address the same problem” and each discloses “a known way to address that problem,” “there’s a motivation to combine under *KSR* and our precedent.”); *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417–18 (2007); *Adapt Pharma*, 25 F.4th at 1368 (“Here, the

‘interrelated teachings’ of the prior art references support the district court’s finding that a skilled artisan would have been motivated to combine the references.”).

A POSA would use the hinged opening mechanism of VenHuizen on Fiorido since hinged opening mechanisms provide easier access to parts requiring replacement such as the seal. Fiorido was intended for use on known farm implements and the use of VenHuizen’s frame for mounting and support structure for multiple units are expedient means to achieve a common goal. (Ex.1003 ¶¶138, 147, 151–153, 225.)

3. Reasonable expectation of success

A POSA would have reasonably expected to successfully combine the teachings of Fiorido with VenHuizen and AAPA. A hinge, frame, and support structure are well-known mechanical technology with well-known parts operating in the same way for a well-known purpose. (Ex.1003 ¶¶40, 72.) Moreover, a POSA would know that Fiorido’s seed meter, as modified by VenHuizen’s teaching, would still be operable in the environment of the implement on which it is installed with minimal, if any, modifications. (Ex.1003 ¶¶139, 147, 152–153.) Thus, there is a reasonable expectation of success with the proposed combination. *See Almirall LLC v. Amneal Pharms. LLC*, 28 F.4th 265, 275 (Fed. Cir. 2022) (“A finding of a reasonable expectation of success does not require absolute predictability of success.”).

4. Ground 4: Amazone combined with Fiorido, VenHuizen, and Applicant Admitted Prior Art render obvious claims 1–3, 7–12, and 16.

a. Claim 1

i. “A seed distribution element for precision pneumatic seed drills, comprising:”

Amazone discloses: “On the deepest point (Fig. 40/2) of the singling disc the vacuum stops and the seed drops into the seed furrow formed by the sowing coulter.”

(Ex.1011 at 53; Ex.1003 ¶ 104.)



Fig. 35

As discussed above, Fiorido independently discloses this limitation.

ii. “a sowing disc which is rotated by a motor-driven transmission drive shaft at controlled speed,”

“The drive wheels of the precision airplanter drive the singling discs” (Ex.1011 at 48.) A motor in the system causes the drive wheels of the tractor and precision airplanter to turn. This, in turn, transmits torque to cause the singling discs to rotate. Therefore, Amazone discloses a motor-driven transmission.

The mechanism that directly drives the disc is a gear offset to the outer portion

of the housing and is directly mounted to the frame. Given the proposed construction provided, *supra*, there is no drive shaft mounted on the fixed portion of the housing *that is centered relative to the sowing disc*. Therefore, Amazone does not disclose a “transmission drive shaft,” as argued by Maschio in the European File History. (Ex.1003 ¶44.)

But if an argument is made that it is unnecessary for a drive shaft to be mounted to the fixed portion and centered relative to the sowing disk, the shaft supporting the gear that drives the sowing disk would meet the claim limitation.

Moreover, it is obvious to a POSA to use the centrally-located center-driven motor-driven transmission drive shaft of Fiorido on the fixed side of Amazone’s seed disk to rotate the disk. It would be a simple substitution of the peripherally located gearing of Amazone with the centrally located mechanism of Fiorido on the fixed side, a substitution well within the capabilities of those of skill in the art. (Ex.1003 ¶108.) A POSA would have an expectation of success using the centrally-located motor-driven transmission shaft of Fiorido because centrally located drive shafts on the fixed side of the seed disk were well known in seed disks for decades before the priority date of the ’121 patent, as is shown above by Fiorido and VenHuizen.

The speed of the sowing discs is controlled via gearbox settings: “The rev. speed of the singling discs is adjusted on the setting gearbox and on the secondary

gearbox. Gearbox rev. speed changes result in a change of grain spacing in the soil.”

(Ex.1011 at 48, 53, Fig. 39 annotated below; Ex.1003 ¶¶105–108.)

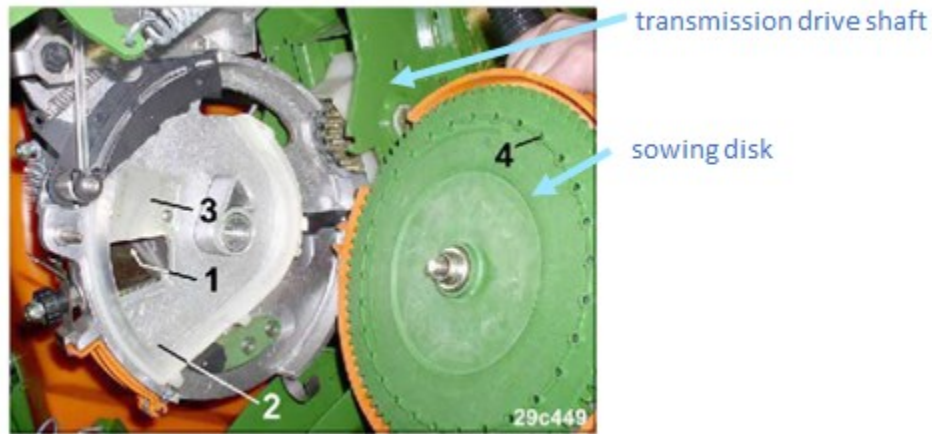


Fig. 39

- iii. “a housing with a fixed portion and a portion which is movable relative to the fixed portion and can be closed against the fixed portion,”

Amazone discloses this limitation. As shown in the figures of the manual, the seed meter has a housing with a portion that is fixed and a portion which is movable relative to the fixed portion and can be closed against the fixed portion. (Ex.1011 at 52–53, Figs. 35, 39 annotated below; Ex.1003 ¶109.)

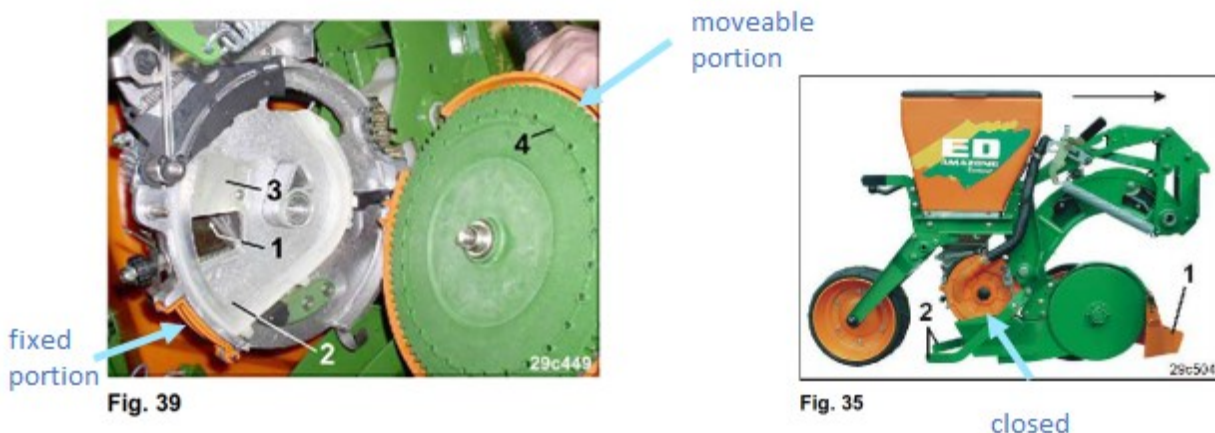


Fig. 35

closed

As discussed above, Fiorido independently discloses this limitation.

iv. “a seed collection chamber being defined in the fixed portion,”

Amazone discloses: “The seed slips out of the seed hopper through the opening (Fig. 39/1) into the seed store area (Fig. 39/2) of the singling disc.” (Ex.1011 at 53; Ex.1003 ¶110.)

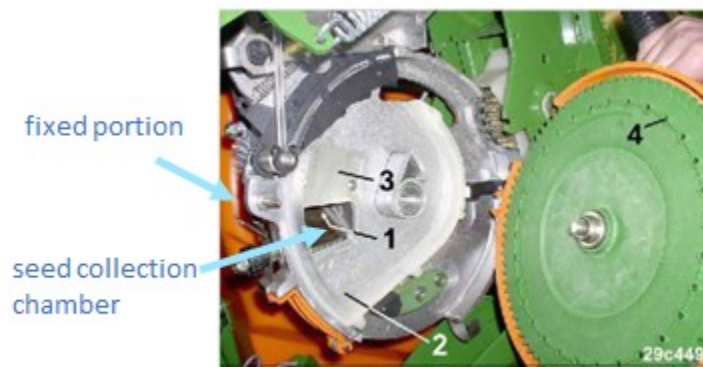


Fig. 39

As discussed above, Fiorido independently discloses this limitation.

v. “a pneumatic suction chamber being defined in the movable portion,”

Amazone discloses: “The impeller provides the vacuum behind the holes (Fig. 39/4) of the rotating singling disc. The seeds are drawn by vacuum off the seed store area on to the holes (Fig. 39/4). The air leaves the seed housing via the slits (Fig. 40/1) of the suction kidney.” (Ex.1011 at 53; Ex.1003 ¶111.)

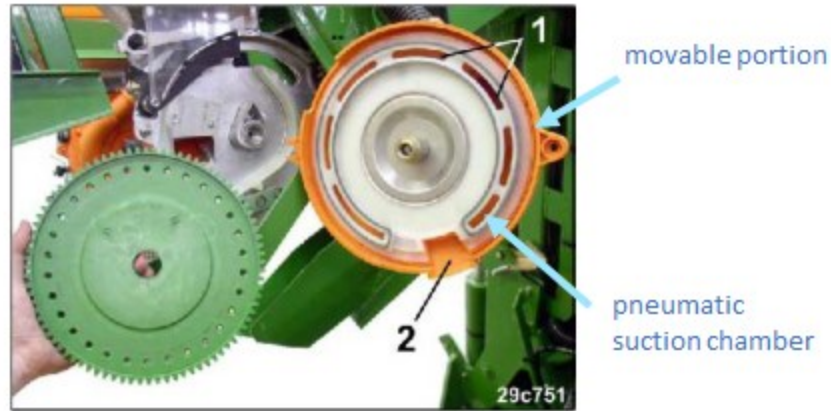


Fig. 40

As discussed above, Fiorido independently discloses this limitation.

- vi. **“the sowing disc being interposed between the fixed and movable portions and having opposed surfaces delimiting the chambers,”**

Amazone discloses: “The seed slips out of the seed hopper through the opening (Fig. 39/1) into the seed store area (Fig. 39/2) of the singling disc. The impeller provides the vacuum behind the holes (Fig. 39/4) of the rotating singling disc. The seeds are drawn by vacuum off the seed store area on to the holes (Fig. 39/4). The air leaves the seed housing via the slits (Fig. 40/1) of the suction kidney.” (Ex.1011 at 53.) The singling discs have opposing sides that constitute the surfaces that cooperatively define the respective seed collection and pneumatic suction chambers. (Ex.1003 ¶112.)



As discussed above, Fiorido independently discloses this limitation.

vii. “the sowing disc having at least one ring of selector holes extending between the opposed surfaces, and”

Amazone discloses singling discs (sowing discs) depicted with a ring of selector holes that extend between opposed surfaces. Further, the manual describes that “the impeller provides the vacuum behind the holes (Fig. 39/4) of the rotating singling disc.” (Ex.1011 at 53; Ex.1003 ¶113.)





Fig. 44

As discussed above, Fiorido independently discloses this limitation.

- viii. **“a seal which is arranged on the movable portion and is capable of sliding contact with the facing surface of the disc when the fixed and movable portions are closed against one another,”**

Amazone discloses a PE-foam profile seal, and the figures show this seal on the movable portion. The seal is affixed to the suction kidney which has an opening at the deepest point of the singling disc. (Ex.1011 at 166, Fig. 227 annotated below.) This opening is aligned with the area where the suction stops and the seed is dropped into the furrow. Based on the description in the manual, the suction kidney does not rotate, and therefore, the affixed seal does not rotate. Thus, the seal makes sliding contact with the facing surface of the disc when the fixed and movable portions are closed against one another. (Ex.1003 ¶114.)



Fig. 227

As discussed above, Fiorido independently discloses this limitation.

ix. “wherein a pressure differential is provided between the opposed surfaces in the region of a circumferential segment of the ring of holes,”

Amazone discloses a pressure differential across the singling disc such that the seeds are drawn by vacuum on to the holes: “The seed is drawn by vacuum on to the holes of the rotating singling discs. The vacuum impeller (Fig. 27/2) provides the necessary vacuum. On the lower most point of the singling disc the vacuum stops and the seed grain drops into the seed furrow created by the sowing coulter (Fig. 27/3).” (Ex.1011 at 48, 53, Fig. 39 annotated below; Ex.1003 ¶115.)

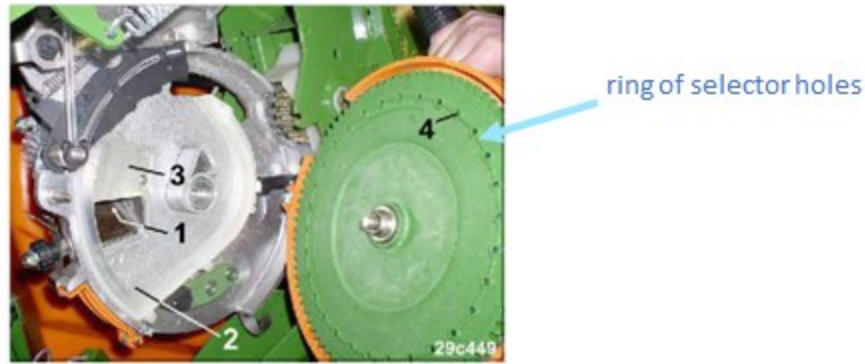


Fig. 39

As discussed above, Fiorido independently discloses this limitation.

- x. wherein the seed distribution element further comprises a thrust-bearing element of the sowing disc, which thrust-bearing element is supported rotatably in the movable portion in order to withstand at least some of the axial load produced by the disc on the seal.



Fig. 227

As discussed above, Fiorido discloses this limitation, and it would be obvious to modify Amazone with the driving disk of Fiorido. (Ex.1003 ¶¶118–119.) First, both Amazone and Fiorido teach structures for use in seed drilling operations—

Amazone teaches a seed meter and its internal components and Fiorido expressly notes its seed meter can “be applied to any known type of planters (not shown) whatsoever”—and both have a fixed and movable sides of a vacuum-operated seed meter housing (Ex.1011 at 52–53; Ex.1007, 5:7–9.) These facts alone provide a motivation to combine Amazone and Fiorido. *Intel*, 61 F.4th at 1380; *KSR*, 127 S. Ct. at 1740; *Adapt Pharma*, 25 F.4th at 1368.

Second, a POSA reading Fiorido would understand Fiorido’s driving disk structure could be adapted to be used in Amazone’s disclosed structure to provide a rotating thrust-bearing element to ensure that excessive wear is not placed upon the seal disclosed in Amazone. (Ex.1003 ¶119.) The Applicant admitted the wear problem and solution of a rotating thrust-bearing element were known. (Ex.1001, 1:53–57.) Fiorido expressly suggests its driving disk thrust-bearing element can be on either side of a seed disk and a POSA would be motivated to address the known problem of seal wear with the known solution provided by Fiorido. (*Id.*) A POSA would consider this a simple rearrangement well within the ordinary level of skill. *See KSR*, 127 S. Ct. at 1740. Thus, a POSA would have had ample motivation to modify Amazone in view of Fiorido.

A POSA would have reasonably expected to combine the teachings of Amazone with Fiorido and AAPA. Vacuum-operated seed meters are well-known mechanical technology with well-known parts. (Ex.1003 ¶¶118–119.) A POSA

would know to modify the movable portion of Amazone to add the driving disk of Fiorido and expect it to perform the same function—receiving of axial load. The substituted parts would continue to work in the same manner for one of the same purposes. (*Id.*) A POSA would know that Amazone, as modified by Fiorido’s teaching, would still be operable in the environment of the implement on which it is installed with minimal, if any, modifications thereto. Thus, there is a reasonable expectation of success with the proposed combination. *See Almirall*, 28 F. 4th at 275.

When the fixed and movable portions are closed together, the thrust-bearing element contacts the sowing disc and withstands some of the axial load produced by the disc on the seal. A POSA understands that the thrust-bearing element must rotate with the disc because otherwise the thrust-bearing element would contribute to wear of the disc, which is antithetical to the purpose of the thrust-bearing element—to alleviate wear resulting from the disc rotation on the seal. (*Id.*)

- g. **Claim 2: “The seed distribution element according to claim 1, wherein the thrust-bearing element is rotated with the disc when the fixed and movable portions are closed against one another.”**



Fig. 227

Fiorido discloses this limitation, and, for the reasons discussed above, it would be obvious to provide a disk like the driving disk of Fiorido including the offset dowel and corresponding hole in the disk into the movable portion of Amazone’s housing to ensure co-rotating of the thrust-bearing element with the disk to minimize wear on the disk. (Ex.1003 ¶¶123–125.)

- h. **Claim 3: “The seed distribution element according to claim 1, wherein the thrust-bearing element comprises a thrust-bearing plate which can bear on that surface of the sowing disc which faces the seal, in a zone radially inside of the ring of Holes.**

The thrust-bearing element of Amazone as modified by Fiorido is a relatively flat, smooth surface—*i.e.*, a plate—that bears on the surface of the sowing disc that faces the seal. Fiorido independently discloses this limitation and it would be

obvious to add the driving disk of Fiorido into the movable portion of Amazone's housing to ensure co-rotating of the thrust-bearing element with the disk to minimize wear on the disk. (Ex.1003 ¶129.) Further, the driving disk of Fiorido would contact the raised surface of Amazone's disk to receive axial load and alleviate forces on the seal of Amazone's movable portion of the housing, and would contact in a zone radially inside of the ring of holes. (*Id.*)

b. Claim 7: "The seed distribution element according to claim 1, wherein the movable portion is hinged to the fixed portion."

Claim 7 is obvious over Amazone in view of VenHuizen and AAPA. As shown above, VenHuizen discloses the limitation of hinging the fixed and movable portion to each other. As explained with respect to ground 3, a POSA would have been motivated to modify Amazone to add a hinge, because both references have fixed and movable sides of a vacuum-operated seed meter housing (Ex.1006, 2:32–40; Ex.1011 at 52–53.) *See Intel Corp.*, 61 F.4th at 1380 **Error! Bookmark not defined.** A POSA would use the hinged opening mechanism of VenHuizen on Amazone since hinged opening mechanisms provide easier access to parts requiring replacement such as the seal and a POSA would have a reasonable expectation of success in using this well known structure. (Ex.1003 ¶¶140–142.)

- c. **Claim 8: “A sowing element for precision seed drills comprising a frame on which a seed distribution element according to claim 1 is mounted.”**

Amazone discloses a sowing element for precision seed drills comprising a frame on which the seed distribution element is mounted. (Ex.1011 at 52, Fig. 35 annotated below; Ex.1003 ¶148.)

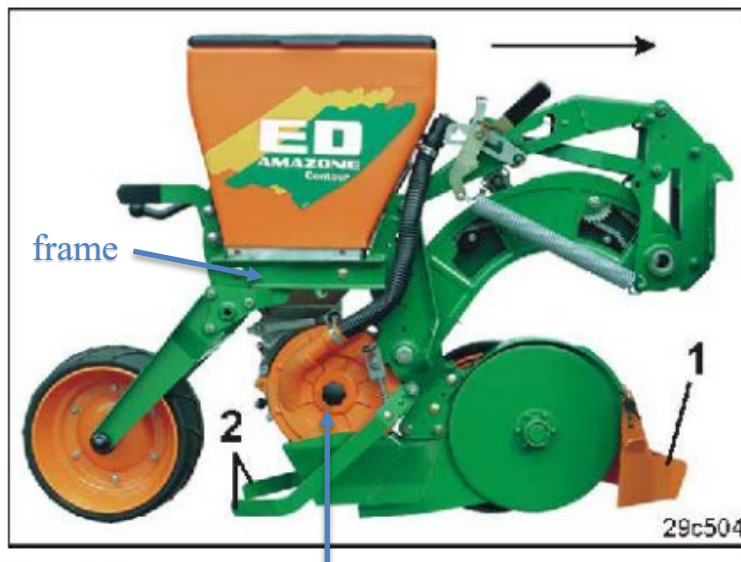


Fig. 35 Seed distribution element

- d. **Claim 9: “A seed drill comprising a support structure on which a plurality of sowing elements according to claim 8 are mounted.”**

Amazone discloses: “Precision Airplanters place the individual seed grains in evenly settable distances into the soil. In every row one seeder unit with own seed hopper is operating”. (Ex.1011 at 48, as depicted below; Ex.1003 ¶154.)



e. Claims 10–12 and 16

Independent claim 10’s scope is nearly identical to independent claim 1 except claim 10 recites the structure of the movable portion of the housing being a pre-assembled kit with the thrust-bearing element. *See supra*, VIII.B.4.(a–e). Dependent claims 11, 12, and 16 refer back to the dependent claim elements of claims 2, 3, and 7, respectively, using the following language: “The kit according to claim 10 wherein the movable portion and the thrust-bearing element comprise at least one feature according to claim [2, 3, 7].” (*See Ex.1001*, 6:7–13, 21–25.)

Fiorido discloses a kit for the reasons discussed above. In view of Fiorido’s teaching that a seed distribution element may be a kit, a POSA would understand that Amazone’s seed distribution element could also be applied as a retrofit because all of the elements of the seed distribution element are self-contained. Indeed, there is nothing about the seed distribution element disclosed in the Amazone manual that

would make it incompatible with retrofit. (Ex.1003 ¶189.) Amazone, as modified by Fiorido’s thrust-bearing element as described in claims 1, 2, and 7, could also be pre-assembled as a retrofit kit. (*Id.* ¶¶203–205.) Accordingly, for the same reasons as discussed with respect to claims 1–3 and 7, Amazone combined with Fiorido, VenHuizen, and AAPA render obvious claims 10–12 and 16. (*Id.* ¶¶209–211, 215–26, 227–229.)

IX. Certification of Grounds for Standing

Precision certifies that the ’121 patent is available for *inter partes* review and Precision is not barred or estopped from requesting *inter partes* review challenging the claims of the ’121 patent on the grounds identified herein.

X. Mandatory Notices Under 37 C.F.R. § 42.8

Real Parties-In-Interest: Precision Planting LLC is the petitioner herein. In an abundance of caution, Precision further identifies the following affiliated entities that are real parties-in-interest herein: AGCO Corp., Monsanto Co., and Bayer AG.

Related Matters: Petitioner is aware of the following related matter: *Maschio Gaspardo S.p.A. v. Precision Planting LLC*, District of Delaware Civil Number 1:2022-cv-01394, filed October 24, 2022, 2022, in which Precision is alleged to infringe claims of the ’121 patent.

Lead and Back-Up Counsel and Service Information:

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Precision consents to electronic service by email at the above listed email addresses of lead and back-up counsel.

XI. Payment of Fees Under 37 C.F.R. §§ 42.15(a) and 42.103

The required fees are submitted herewith. If any additional fees are due at any time during this proceeding, the Office is authorized to charge such fees to Deposit Account No. 19-0522.

XII. Conclusion

The asserted prior art references and proposed combinations disclose technological teachings that were not previously considered or relied upon on the record during original examination of the '121 patent. These references provide new, non-cumulative technological teachings, which establish a reasonable likelihood of success as to Petitioner's assertion that claims 1–5, 7–14, and 16 of the '121 patent are not patentable.

Accordingly, Precision respectfully requests institution of *inter partes* review for claims 1–5, 7–14, and 16 of the '121 patent for each of the grounds presented herein.

Dated: October 4, 2023

Respectfully submitted,
HOVEY WILLIAMS LLP

BY: /s/ Scott R. Brown

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ATTORNEYS FOR PETITIONER

Certification under 37 CFR § 42.24

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for *Inter Partes* Review as reported by the word count functionality of Microsoft Word totals 13,885 words, not including the Table of Contents, Table of Authorities, Mandatory Notices, Certificate of Service, or Certification of Word Count, which is less than the 14,000 words allowed under 37 CFR § 42.24.

Dated: October 4, 2023

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ATTORNEYS FOR PETITIONER

Certificate of Service on Patent Owner

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105, the undersigned certifies that on October 4, 2023, a complete and entire copy of this ***Petition for Inter Partes Review*** with all supporting exhibits was provided via U.S. Mail, postage prepaid, to the Patent Owner by serving the correspondence address of record for the '121 patent:

Castellano PLLC
PO Box 1555
Great Falls, Virginia 22066

and a courtesy copy to Maschio Gaspardo's litigation counsel, via email:

Neil Benchell
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/s/ Scott R. Brown