

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Champion Laboratories, Inc.,
First Brands Group, LLC,
Petitioners

v.

Hengst SE,
Patent Owner

Case IPR2024-00603
Patent 9,023,203

**DECLARATION OF MICHAEL NRANIAN IN SUPPORT OF
PETITION FOR INTER PARTES REVIEW OF
UNITED STATES PATENT NO. 9,023,203**

TABLE OF CONTENTS

I.	INTRODUCTION.....	1
II.	BACKGROUND AND QUALIFICATIONS.....	2
III.	MATERIALS REVIEWED.....	26
IV.	LEGAL STANDARDS	27
	A. Obviousness	27
	B. Claim Construction.....	32
V.	PERSON OF ORDINARY SKILL IN THE ART AND THE TIME OF THE ALLEGED INVENTION.....	33
VI.	The '203 patent	34
	A. Description of the '203 patent's Specification.....	34
	B. The '203 patent's Prosecution History	35
	C. Interpretation of the '347 Challenged Claims.....	37
VII.	SUMMARY OF THE PRIOR ART	43
	A. Yokoyama (Ex. 1008)	43
	B. Honermann (Ex. 1006).....	44
	C. Deschamps (Ex. 1010)	46
VIII.	Ground 1: Yokoyama Renders Obvious Claims 15-17, 19, 23, 25, 30	49
	A. Claim 15.....	52
	15[pre]: A ring filter insert for a liquid filter, comprising	52
	15[a]: A hollow-cylindrical filter material body surrounded on front sides by top and bottom front panels and which can be replaceably arranged in a filter housing,.....	53
	15[b]: an eccentric blocking element arranged on the bottom front panel for engaging an eccentric opening in the filter housing, ...	56
	15[c]: first positioning means on the ring filter insert, which interact with second positioning means on the filter housing when the ring filter insert is inserted into the filter housing and which are arranged to	

	bring the blocking element into engagement with the eccentric opening,.....	59
	15[d]: the first positioning means being one of an inclined plane and a protruding nose, with the second positioning means being the other of the inclined plane and the protruding nose, ...	59
	15[e]: the inclined plane and the nose arranged to be moved in relation to each other in such a way that they slide along each other and bring the blocking element into engagement with the eccentric opening, by rotating the ring filter insert relative to the filter housing, ...	64
	15[f]: the first positioning means being one of embodied and arranged on an inner circumference of the ring filter insert.	66
B.	Claim 16: The ring filter insert according to claim 15, wherein the inclined plane is formed by two partial planes which run towards each other in opposite directions and which in each case extend across half of an inner circumference of the ring filter insert.	67
C.	Claim 17: The ring filter insert according to claim 15, including a guide for the nose which runs in an axial direction and is connected to a lower end of the inclined plane.....	69
D.	Claim 19: The ring filter insert according to claim 15, wherein the inclined plane is formed by one of a radially protruding rib and step which forms a contact surface for the nose on one of an upper or lower side thereof.....	71
E.	Claim 23: The ring filter insert according to claim 15, wherein the nose is formed integrally with the bottom front panel of the ring filter insert.	72
F.	Claim 25: The ring filter insert according to claim 15, wherein the blocking element is an axially sealing valve element which is elastically arranged on the bottom front panel.	73
G.	Claim 30: The ring filter insert according to claim 15, wherein the protruding nose protrudes radially.....	74
IX.	Ground 1: Yokoyama and Cline Render Obvious Claims 15-17, 19, 23-25, 28-30	75
A.	Motivation to Combine	75
B.	Claim 15	82
	15[b]: an eccentric blocking element arranged on the bottom front panel for engaging an eccentric opening in the filter housing, ...	82

15[c]: first positioning means on the ring filter insert, which interact with second positioning means on the filter housing when the ring filter insert is inserted into the filter housing and which are arranged to bring the blocking element into engagement with the eccentric opening,.....	83
15[e]: the inclined plane and the nose arranged to be moved in relation to each other in such a way that they slide along each other and bring the blocking element into engagement with the eccentric opening	85
C. Claim 24: The ring filter insert according to claim 15, wherein the blocking element is one of a radially sealing valve element, an axially sealing valve element, and a radially sealing plug which is one of rigidly connected to the lower front panel and rigidly arranged on the lower front panel.	86
D. Claim 25: The ring filter insert according to claim 15, wherein the blocking element is an axially sealing valve element which is elastically arranged on the bottom front panel.	89
E. Claim 28: The ring filter insert according to claim 15, wherein the blocking element is formed from two parts, the two parts of the blocking element being engaged with each other in a manner allowing a compensation of radial dimension tolerances and angle errors.	90
F. Claims 16, 17, 19, 23, 30.....	91
X. Ground 3: Honermann and Cline render Obvious Claims 1, 2-3, 5, 8-11, 15-17, 19, 23-25, 28-30	91
A. Motivation to Combine	93
B. Claim 1	100
1[pre]: A liquid filter, comprising:	100
1[a]: a filter housing, ...	100
1[b]: a ring filter insert, replaceably arranged in the filter housing,.....	101
1[c]: a removeable cover arranged to close the filter housing during operation, ...	102
1[d]: the filter housing including at least one inlet for raw liquid to be filtered, which inlet leads into a raw side of the filter housing, and	104
1[e]: a return extending from a clean side of the filter housing for filtered clean liquid, ...	106

1[f]: an eccentric opening arranged in a bottom of a filter housing, ...	108
1[g]: the ring filter insert comprising a hollow-cylindrical filter material body, surrounded on the front sides by top and bottom from panels, the ring filter insert separating the raw side of the filter housing and the clean side of the filter housing from each another, ...	109
1[h]: an eccentric blocking element for the eccentric opening arranged on the bottom front panel, ...	112
1[i]: first and second interacting positioning means each on one of the ring filter insert and the filter housing and arranged to bring the blocking element into engagement with the eccentric opening when the ring filter insert is inserted into the filter housing, 1[j]: the first positioning means comprising an inclined plane, 1[k]: the second positioning means comprising a protruding nose which is arranged opposite the inclined plane, and	114
1[l]: the inclined plane and the nose arranged to be movable in relation to each other in such a way that they slide along each other and bring the blocking element into engagement with the eccentric opening, by rotating the ring filter insert relative to the filter housing, ...	118
1[m]: the inclined plane being one of embodied and arranged on one of the inner circumference of the ring filter insert and the outer circumference of a filter housing part arranged inside the ring filter insert and the protruding nose being one of embodied and arranged on the other of the inner circumference of the ring filter insert and the outer circumference of the filter housing part, ...	120
1[n]: the inclined plane comprising an incline which excludes a self-locking and	122
1[o]: the eccentric opening being an outlet for emptying the filter housing when the filter insert is removed.	123
C. Claim 3: The liquid filter according to claim 1, including a guide for the nose which runs in an axial direction and is connected to a lower end of the inclined plane.	125
D. Claim 5: The liquid filter according to claim 1, wherein the inclined plane is formed by one of a radially protruding rib and step, which forms a contact surface for the nose on one of an upper and lower side thereof.	125
E. Claim 8: The liquid filter according to claim 1, wherein the nose is formed integrally with one of the filter housing and the ring filter insert.	126

F.	Claim 9: The liquid filter according to claim 1, wherein the blocking element is one of a radially sealing valve element, an axially sealing valve element and a radially sealing plug which is one of rigidly connected to and rigidly arranged on the bottom front panel.	127
G.	Claim 10: The liquid filter according to claim 1, wherein the blocking element is an axially sealing valve element which is elastically arranged on the bottom front panel.	127
H.	Claim 11: The liquid filter according to claim 1, wherein the outlet comprises a seat which is one of incorporated on a side of the filter housing and is inserted as a separate part and which conforms to a shape of the blocking element.....	128
I.	Claim 29: The liquid filter according to claim 1, wherein the protruding nose protrudes radially.	129
J.	Claim 15	130
	15[pre]: A ring filter insert for a liquid filter, comprising	130
	15[a]: A hollow-cylindrical filter material body surrounded on front sides by top and bottom front panels and which can be replaceably arranged in a filter housing,.....	130
	15[b]: an eccentric blocking element arranged on the bottom front panel for engaging an eccentric opening in the filter housing, ...	131
	15[c]: first positioning means on the ring filter insert, which interact with second positioning means on the filter housing when the ring filter insert is inserted into the filter housing and which are arranged to bring the blocking element into engagement with the eccentric opening,.....	131
	15[d]: the first positioning means being one of an inclined plane and a protruding nose, with the second positioning means being the other of the inclined plane and the protruding nose, ...	132
	15[e]: the inclined plane and the nose arranged to be moved in relation to each other in such a way that they slide along each other and bring the blocking element into engagement with the eccentric opening, by rotating the ring filter insert relative to the filter housing, ...	132
	15[f]: the first positioning means being one of embodied and arranged on an inner circumference of the ring filter insert.	133

K.	Claim 17: The ring filter insert according to claim 15, including a guide for the nose which runs in an axial direction and is connected to a lower end of the inclined plane.....	133
L.	Claim 19: The ring filter insert according to claim 15, wherein the inclined plane is formed by one of a radially protruding rib and step which forms a contact surface for the nose on one of an upper or lower side thereof.....	133
M.	Claim 23: The ring filter insert according to claim 15, wherein the nose is formed integrally with the bottom front panel of the ring filter insert.	133
N.	Claim 24: The ring filter insert according to claim 15, wherein the blocking element is one of a radially sealing valve element, an axially sealing valve element, and a radially sealing plug which is one of rigidly connected to the lower front panel and rigidly arranged on the lower front panel.	133
O.	Claim 25: The ring filter insert according to claim 15, wherein the blocking element is an axially sealing valve element which is elastically arranged on the bottom front panel.	134
P.	Claim 28: The ring filter insert according to claim 15, wherein the blocking element is formed from two parts, the two parts of the blocking element being engaged with each other in a manner allowing a compensation of radial dimension tolerances and angle errors.	134
Q.	Claim 30: The ring filter insert according to claim 15, wherein the protruding nose protrudes radially.....	134
XI.	DESCHAMPS RENDERS OBVIOUS CLAIMS 1, 2-3, 5-6, 8-11, 15-17, 19, 23-25, 28-30	134
A.	Claim 1	135
	1[pre]: A liquid filter, comprising:	135
	1[a]: a filter housing, ...	135
	1[b]: a ring filter insert, replaceably arranged in the filter housing, and.....	136
	1[c]: a removable cover arranged to close the filter housing during operation, ...	138
	1[d]: the filter housing including at least one inlet for raw liquid to be filtered, which inlet leads into a raw side of the filter housing, and 1[e]: a return extending from a clean side of the filter housing for filtered clean liquid, ...	139
	1[f]: an eccentric opening arranged in a bottom of the filter housing, ...	141

1[g]: the ring filter insert comprising a hollow-cylindrical filter material body, surrounded on front sides by top and bottom front panels, the ring filter insert separating the raw side of the filter housing and the clean side of the filter housing from each another, ...	141
1[h]: an eccentric blocking element for the eccentric opening arranged on the bottom front panel, ...	143
1[i]: first and second interacting positioning means each on one of the ring filter insert and the filter housing and arranged to bring the blocking element into engagement with the eccentric opening when the ring filter insert is inserted into the filter housing, 1[j]: the first positioning means comprising an inclined plane, 1[k]: the second positioning means comprising a protruding nose which is arranged opposite the inclined plane, and	144
1[l]: the inclined plane and the nose arranged to be movable in relation to each other in such a way that they slide along each other and bring the blocking element into engagement with the eccentric opening, by rotating the ring filter insert relative to the filter housing, ...	149
1[m]: the inclined plane being one of embodied and arranged on one of the inner circumference of the ring filter insert and the outer circumference of a filter housing part arranged inside the ring filter insert and the protruding nose being one of embodied and arranged on the other of the inner circumference of the ring filter insert and the outer circumference of the filter housing part, ...	150
1[n]: the inclined plane comprising an incline which excludes a self-locking and	154
1[o]: the eccentric opening being an outlet for emptying the filter housing when the filter insert is removed.	154
B. Claim 15	155
15[pre]: A ring filter insert for a liquid filter, comprising	155
15[a]: A hollow-cylindrical filter material body surrounded on front sides by top and bottom front panels and which can be replaceably arranged in a filter housing, ...	155
15[b]: an eccentric blocking element arranged on the bottom front panel for engaging an eccentric opening in the filter housing, ...	156
15[c]: first positioning means on the ring filter insert, which interact with second positioning means on the filter housing when the ring filter insert is inserted into the filter housing and which are arranged to	

bring the blocking element into engagement with the eccentric opening,.....	156
15[d]: the first positioning means being one of an inclined plane and a protruding nose, with the second positioning means being the other of the inclined plane and the protruding nose, ...	157
15[e]: the inclined plane and the nose arranged to be moved in relation to each other in such a way that they slide along each other and bring the blocking element into engagement with the eccentric opening, by rotating the ring filter insert relative to the filter housing, ...	157
15[f]: the first positioning means being one of embodied and arranged on an inner circumference of the ring filter insert.	158
XII. CONCLUSION.....	158

I. INTRODUCTION

1. I have been retained by Champion Laboratories, Inc. and First Brands Group, LLC (“Petitioners”) as an independent expert consultant in this proceeding before the United States Patent and Trademark Office (“PTO”) against Hengst SE (“Patent Owner”) regarding U.S. Patent No. 9,023,203 (“the ’203 patent”) (Ex. 1001). I have been asked to submit this Declaration on behalf of Petitioners.

2. I have been asked to consider whether certain references disclose or render obvious the features recited in claims 1, 3, 5, 8-11, 15-17, 19, 23-25, and 28-30 (collectively, the “Challenged Claims”) of the ’203 patent. My opinions are set forth below. Based on my experience and expertise, it is my opinion that the prior art renders obvious all limitations of the Challenged Claims, as I discuss in detail below.

3. I am being compensated at a rate of \$450 per hour for my work in this proceeding. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this or any other proceeding. I have no other interest in this proceeding.

4. All of my opinions stated in this Declaration are based on my own personal knowledge and professional judgment. I am over 18 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth in this Declaration.

II. BACKGROUND AND QUALIFICATIONS

5. Aspects of my education, experience, and qualifications and some details about my employment history are included in my CV which is Exhibit 1011 in this proceeding. My CV also includes a list of the cases in which I have testified as an expert witness at deposition, hearing, or trial during the past four years. I have had no publicly disclosed publications in the last 10 years, other than the patents described later in this report. In addition to my current position as a vehicle engineer in the U.S. Army, I am also currently the principal of Automotive Design Analysis, a multi-disciplinary company that provides professional consulting, technical, and engineering services that I established in 2003.

6. In the following paragraphs, I will present some aspects of my technical, scientific, and engineering background that are relevant to the automotive engineering and service, engine and filter component and assembly design, design for service, design for assembly, automotive service procedures, replacement, maintenance, and sustainment, including as related to internal combustion engines and liquid/fluid filter technologies, as well as other issues involved in this matter, as well as some background for forming the opinions set forth in this Report.

7. My academic background is in engineering, and I also have over 35 years of work experience as an engineer and engineering manager in the automotive industry, including my work for Automotive Original Equipment Manufacturers

(“OEMs”) and the supply base, and also as an engineer and civilian employee for the U.S. Army. My educational background includes a Bachelor of Science in Chemical Engineering, a Bachelor of Science in Electrical and Computer Engineering, a Master of Science in Electrical Engineering, and a Juris Doctor from Wayne State University. I also received a Master of Business Administration from the University of Michigan. I also am a licensed Professional Engineer, Certified Project Management Professional, as well as a Lean Six Sigma Black Belt certified through the American Society for Quality and the International Quality Federation. This Lean Six Sigma background as well as my extensive work experience in automotive components and systems, including mechanical and chemical/material design, testing, and development, including specifically engines and fluid filter architectures, including engine oil filters, design for assembly, design for service (including ease of service and replacement, maintenance, and sustainment), automotive dealership and after-market service techniques and procedures, automotive component and system performance, validation, root cause analyses, engine component and powertrain systems (including for gas and diesel engines), and also my extensive automotive design, testing, development, and validation, experience which provides decades of real-world application experience to address the technologies discussed and claimed in the '203 Patent.

8. Although I have a law degree, and I am licensed to practice before the United States Patent and Trademark Office, I have not been asked to opine on any legal issues. I will not be giving any legal opinions throughout this report and throughout my work on this matter. My opinions provided herein are based on my engineering, technical, scientific, automotive, and automotive industry business education and experience. If requested, I also expect to testify with respect to my educational and professional background.

9. I have extensive industry experience in the automotive industry for multiple companies. For example, I worked as a design engineer, senior project engineer, design analysis engineer, technical specialist, and engineering manager in the automotive industry from 1985 to 2007, which includes experience at Ford, General Motors, and Allied Signal. I worked at Allied Signal from 1992 to 1993, General Motors from 1993 to 1995, and Ford Motor Company from 1985 to 1992, and from 1995 to 2007. Also, my work after 2007, and my current work for the U.S. Army at the Ground Vehicle System Center (formerly known as TARDEC – Tank and Automotive Research Development and Engineering Center) at TACOM (Tank and Automotive Command) involves extensive application of automotive technologies. For example, approximately 80 percent of military ground vehicle systems are directly automotive related. My background and current work involves extensive responsibilities involving combustion engine and the related filters, and design for

service, replacement, maintenance, and sustainment of vehicles and systems as related to these components and assemblies, service techniques and procedures, as well as mitigation of detrimental environmental aspects & effects for the day-to-day operation, performance, maintenance, cleanliness, environmental friendliness, and sustainment of these systems and components.

10. For example, while at Ford, General Motors, and Allied Signal, I worked as a Product Design Engineer, a Senior Project Engineer, a Technical Specialist, a Design Analysis Engineer, and an Engineering Manager. I also have worked as a senior systems engineer and component engineer for military ground vehicles (including those systems that involve automotive – including heavy truck applications- e.g. gas and diesel engines, and the service of these systems including filters (engine oil, transmission, fuel, coolant, air/gas, cabin, emissions, etc.), and seals, gaskets, plugs, drainage mechanisms, and associated assessment/mitigation/prevention of leakage paths (including during performance and operation and after service and maintenance), and the related replacement, and sustainment of these systems and components), at General Dynamics, Raytheon, and in my current position for the U.S. Army. My work as a senior systems engineer and component engineer involves extensive development, testing, and analyses of systems and components for automotive / military ground vehicles. My work included and currently includes the design and development of automotive systems and components

for various different types of automotive applications. This includes, among other things, testing and development of systems, components, and materials, for engines and specifically gas and diesel engines and the service, maintenance, and sustainment of these engines, and components and systems, including filters and oil filters, the related component and system designs, assemblies, and architectures, ease of service and replacement, cleanliness, and mitigation of environmental aspects and effects, including as related to spillage and emissions, and spent fluid/oil/gas/soot/particulate/waste effluents, as well as design, testing, development and prove-out of seals, gaskets, plugs, drainage mechanisms, and associated assessment/mitigation/prevention of leakage paths (including during operation and performance and after service and maintenance).

11. During my work at Ford, General Motors, AlliedSignal, General Dynamics, Raytheon, and in my current position for the U.S. Army, areas of my work also include and has included the design, testing, assessment of, and development of, for example, various types of engines and powertrain systems and their related filters. This includes the design for service, design for assembly (including the development, design, testing and release of fasteners and connection systems for the overall system assembly), as well as seals, gaskets, plugs, drainage mechanisms, and associated assessment/mitigation/prevention of leakage paths (including during operation and performance and after service and maintenance), of the components and systems

involving filters (including engine oil filters). This includes design, development, testing, and prove-out for ease of service, maintenance, replacement, and sustainment, cleanliness and mitigation of environmental aspects and effects, during regular operation and performance, and also for service, replacement, maintenance, and sustainment of vehicles, components, and systems. This includes methods used to reduce environmental waste and emissions, improve recyclability, ease assembly, ease maintenance and service, and improve reliability and durability, for sustainment, including the related filters, drainage systems, and replacement of fluids for regular maintenance and sustainment. This also includes design for assembly, dis-assembly, re-assembly, and replacement, as well as the related fastener and connection components and systems, for filters, fluids, as used in engines, transmissions, powertrain, environmental decontamination, interior occupant cabin, steering, braking, cooling, heating, air/gas, exhaust, and vehicle emission systems, as well as the associated electrical and electro-mechanical sensors and controls, assessment of chemicals and materials, and assessment and development of seals gaskets, plugs, drainage mechanisms, and associated assessment/mitigation/prevention of leakage paths (including during operation and performance and after service and maintenance).

12. I have extensive experience in designing, developing and testing automotive systems and components, including gasoline and diesel fuel engine systems and oil filters, fluid drainage and replacement components and systems, for automotive

and military vehicle applications. This includes, for example, diesel and gasoline engines, electric vehicles and hybrid vehicles, auxiliary power units (generators - such as those employed for silent running), and the design for assembly, service, maintenance, replacement, and sustainment. I also have extensive experience in automotive dealership and after-market service techniques and procedures. This also includes automotive, truck, and heavy/military vehicle and engine testing and compliance experience, service, maintenance, and sustainment components and procedures. This also includes overall life-cycle and environmental testing, for durability and reliability performance.

13. My work also includes analyses, and testing regarding gasoline and diesel engines, including assessment of filter performance and reliability over long-term vehicle life, replacement and maintenance, and fluid and oil drainage and replacement, and service. This also includes environmental and corrosion assessment, and assessments of chemicals and materials, oils and lubricants, filters and filter assemblies, engines and powertrain components, and seals, gaskets, plugs, drainage mechanisms, and associated assessment/mitigation/prevention of leakage paths (including during operation and performance and after service and maintenance). This includes, among other things, testing and development of systems, components, and service tools, service procedures, including, for example, those used for engines, filters, and fluid drainage and replacement as used for, for example, OEM and aftermarket

vehicle (e.g., automotive, heavy truck, and military vehicle) applications. This also includes extensive experience in design, development, testing and evaluation of automotive engines and equipment, automotive tools and maintenance equipment for automotive vehicles and engines; oil/fluid drainage and replacement, filter replacement, and components for various different types of automotive applications and quality and reliability experience. I also have extensive experience in automotive safety, safe and efficient repair and component replacement procedures and methods, including system and component evaluations, laboratory tests, supplier and technology assessments, quality and reliability evaluations, manufacturing supplier and sourcing evaluation and selection, and the associated testing and development of these components and systems through environmental, life-cycle, crash testing, and long-term durability and reliability testing. This includes experience in vehicle mechanical structural designs, brackets, fasteners, service tools and equipment, engine and powertrain components and systems, fluid and oil filters, lubricants, diagnostics equipment, and retention and mounting system design, and materials selection, including as related to proper performance for long term vehicle durability and reliability, including vehicle rough road and off-road, ride/handling/braking, and environmental testing and performance.

14. My work also includes simulation benches and desk-top laboratories to simulate engine performance duplicating that as used in the vehicle for assessment

of power management, thermal management, lubrication, performance, and life-cycle analyses. My work has included and currently includes extensive testing and analyses involving feedback from sensors (e.g. for analyses of exhaust gas temperatures, emissions, Nitrogen Oxides, Carbon Monoxide, Carbon Dioxide, PM, soot etc., and assessment of engine combustion efficiency). For example, I have also served as an expert witness and testified regarding filters and fluids, and the related service cycles, and maintenance procedures. I also have served as an expert for emissions as related to Particulate Matter (PM), soot, NOx burn-off for air pollution reduction specifically for systems involving failure of compliance to Environmental Protection Agency (EPA) and California Air Resources Board (CARB) regulatory requirements involving, specifically for example, a 15 Million dollar vehicle recall. I personally developed test protocols and performed testing in this matter related to filters, performance, and service cycles and maintenance and diagnostic procedures, and measured environmental and temperature effects on various vehicle/engine components to determine causes of failure. I am extensively experienced in the use of diagnostic tools (e.g. rotunda tools, OBD-II data communication interfaces, J-1939 data communication interfaces, CAN-BUS interfaces (e.g. vehicle spy), and electrical/electronic module readout tools and interfaces. I am also extensively experienced in material and chemical analyses, including infrared spectroscopy, and gas chromatography, For example, for many years, I served as a corporate

representative and expert witness for Ford Motor Company, in the Design Analysis Group, where I conducted forensic investigation of field events including those involving engine and vehicle powertrain system diagnosis, material and chemical analyses, and root-cause analyses, and testified extensively regarding my analysis and findings. In short I served extensively as an expert witness and corporate representative for Ford, and conducted hundreds of forensic investigations throughout the United States. My analyses and testimony has included engine and vehicle systems, maintenance and service, including engine and powertrain systems and components, including filters (e.g. oil, transmission, cooling, etc.) fluids, and chemical and material analyses. This includes extensive investigation of vehicle service procedures, evaluation of whether proper service procedures and methods were followed, assessment of vehicle service procedures and instructions, including evaluation of vehicle service tools and procedures, including as related to engines, engine oil replacement, oil filter replacement, fan belts, serpentine belts, drive belts, drive chains, pulleys, compressors, turbochargers, superchargers, alternators, radiator/condenser fans, transmission oil coolers, engine oil coolers, and the related filters and fluids, and also other vehicle components requiring service and replacement. This includes extensive experience authoring and reviewing service manuals/instructions/procedures, and automotive service tools, automotive repair, automotive component accessibility, and automotive component replacement, and the

associated automotive service tools, diagnostics, assessment, methods, and procedures, including engine maintenance, oil filter replacement, and oil drainage and replacement. I have also testified extensively as an engineering and automotive expert regarding service procedures, service tools, service manuals and procedures, and proper diagnostic assessment of vehicle components and systems, as well as proper design of automotive service tools (including specifically vehicle engine, powertrain, engine oil, and oil filters). I also have extensive experience as a release engineer and engineering releasing components and systems for use in these automotive applications, as well as proper service tools and procedures. For example, from 1999 to 2007, while working as an automotive expert witness and corporate representative for Ford, I testified in State and Federal Courts throughout the country involving forensic analysis of product defects and warranty and reliability concerns in products belonging to customers out in the field. This includes extensive evaluation and the related testimony of proper service tools and procedures, and evaluation of whether or not proper service was provided by dealerships, service shops, regarding proper vehicle repair and component replacement, including as related to engines, engine oil, filters, and numerous other components and systems. I also have served as an expert in several other cases involving automotive system and component forensic analysis, including issues related to proper and/or improper service, diagnostics, service tools and procedures, instructions, and warnings.

15. I have in-depth experience in vehicle diagnostic, OBDII interfaces, vehicle bus interfaces, class II and serial communication protocols, vehicle diagnostic and inter-module and inter-standards/protocols data transfer and communication (e.g. gateways). I also have extensive experience in the design of engines and powertrain systems, oil and lubrication components and systems, filters (including oil filters, and fluid drainage and replacement, and maintenance and service procedures). This includes seals, gaskets, plugs, drainage mechanisms, and associated assessment/mitigation/prevention of leakage paths (including during operation and performance and after service and maintenance). This includes design for assembly, design for service, and assessment of reliability, durability, and performance over maintenance and service cycles, over long-term vehicle life. This also includes environmental, temperature, testing and assessment over environmental and temperature extremes, for durability and reliability performance and corrosion resistance. This also includes recyclability, and mitigation of environmental aspects, effects, and waste (landfill material reduction, and special handling). I testified extensively in depositions and trials regarding these types of vehicle systems and procedures. I also have conducted hundreds of forensic investigations and also served as a corporate representative and/or expert witness numerous times in litigation involving vehicle forensic and material analyses for automotive systems and components. I also currently work on engines (including filters and fluids, oil, and

lubrication, and the associated seals, gaskets, plugs, drainage mechanisms, and associated assessment/mitigation/prevention of leakage paths (including during operation and performance and after service and maintenance), and also including the reliability and durability performance, service, and disposal) in my current position for the U.S. Army, for where I also currently possess an active Secret Security Clearance, which I have held since 2009.

16. Also, for example, during my practical work experience and also while obtaining my engineering degrees, much of my experience and education, involves and has involved engine, materials, chemicals, lubricants, oils, fluids, and the performance and assessment as related to regular maintenance, service, and reliability of component and system performance over maintenance cycles and over long-term vehicle life.

17. Also, for example, I authored “Methods of Measuring Light Scattering Films”, a 1987, SAE 870319 Technical Paper, involving the use of infrared spectroscopy for chemical and material analyses, that I presented at SAE in Cobo Hall in Detroit, Michigan. I am also a co-inventor on U.S. Patent No. 8,860,159 - Spintronic Electronic Device and Circuits, which, among other novel features, describes and claims an antenna and associated circuitry for detection of radio frequency waves (e.g., a beam of microwave energy), using a spintronic electronic apparatus having a multilayer structure that can operate in large amplitude, out-of-plane magnetization precession regime, which, depending on the circuit structure, can be adjustably biased

and used to detect low frequency microwave signals that exceed a predetermined threshold current and have a frequency lower than a predetermined level. In alternative embodiments, the apparatus can be used for frequency identification of incoming electromagnetic waves and/or energy harvesting of incoming electromagnetic waves. I am also co-inventor on U.S. Patent No. 9,003,562 - Body Armor, which discloses a body armor system for improved ballistic protection (including femoral artery protection) for mitigation of injury and death to our soldiers who are at risk as they defend our nation. Also, for example, General Motors applied for and was granted a Statutory Invention Registration for rear-facing infant seat child/occupant detection and position detection using technologies that I developed employing either electronic circuits and infrared emitters and receptors, or alternatively emitters and detectors using light in the visual wavelength range, that I conceived of and developed.

18. I have also drafted numerous corporate standards, service procedures and recommended maintenance cycles, design for assembly, design for service, design for ease of replacement and sustainment specifications, requirements, instructions, manuals, and procedures, and I also signed-off on compliance to service and maintenance procedures, as well as regulatory requirements and corporate standards as a design and release engineer, technical specialist, lean six-sigma black belt, and engineering manager for Ford, General Motors, and the supply base. Areas of my work also include and have included engine, lubricant, oil and fluid systems, and the related

integration, assembly and fastening connection designs and techniques, as well as the assessment, testing, development, and approval of the seals, gaskets, plugs, drainage mechanisms, and associated assessment/mitigation/prevention of leakage paths (including during operation and performance and after service and maintenance), for these components and systems. My work had included laboratory tests, in-vehicle assessments, technology and prototype component assessments, test-track, dynamometer, test-track rough road, off-road, laboratory, design validation, production validation, Production Part Approval Process (PPAP), durability cycle, as well as product testing, development, and performance verification and assessment, over long term vehicle life (e.g. 100,000 mile) and temperature and environmental exposure extremes.

19. My responsibilities also included ensuring compliance with regulatory and validation requirements (e.g. Environmental Protection Agency (EPA), California Air Resources Board (CARB), Federal Motor Vehicle Safety Standards (“FMVSS”), Economic Commission for Europe (“ECE”) regulations, Industry Standards, Corporate Standards, SAE and ISO standards, various international government regulations, and Due-Care Requirements. I also testified as a corporate representative and expert witness on behalf of Ford. In that role, I have analyzed, verified, and testified regarding compliance with these regulatory requirements, and standards.

20. I have also conducted numerous system and component evaluations, laboratory tests, supplier and technology assessments, quality and reliability evaluations. I wrote and published system level Design Verification Plan and Reports (DVPRs) for prove out of these vehicle systems, including for vehicles containing gas and diesel engine systems and the related oil filters, as well as fluid drainage and replacement and filter replacement for vehicle maintenance and service. My responsibilities include service manuals, service instructions, service tools evaluations, diagnostics and assessment of components as related to proper service and replacement, including technical service bulletins, responses to National Highway Traffic Safety Administration (NHTSA) inquiries, investigation, and recalls. I have also authored and released several of these documents and specifications, and approved components and systems and the associated service tools, procedures, instructions, warnings, as verified per these tests, specifications, service assessments, and requirements. My work also includes all testing requirements for sensors, engine components, oil/fluid/lubricant assessment, seals, gaskets, plugs, drainage mechanisms, and associated assessment/mitigation/prevention of leakage paths (including during operation and performance and after service and maintenance), and electrical/electronic components, as well as design manuals, specifications, requirements, Failure Modes and Effects Analyses (FMEAs), Control Plans, and design standards. I was also frequently involved in the review and implementation,

and approval and sign-off of quality control procedures used to assure these products met customer requirements, federal regulations and standards, as well as corporate and industry standards and requirements, including numerous safety standards, ISO 26262 compliance. I also have extensive experience in manufacturing processes, including process optimization through, for example, design of experiments. I also have extensive experience in lean six sigma techniques, quality processes, process cost and profitability optimization, process output optimization, and manufacturing quality control. My responsibilities include proper six sigma and lean manufacturing processes, design for manufacturing, quality control, and quality assurance, QS/ISO 9000 & 14000, TS 16949, ISO 9001, AS9100, compliance and process assurance, quality operating systems, design for manufacturing.

21. My work experience also includes extensive experience in engine and lubricant assessments, component design, material selection, testing, development, and manufacturing processes, quality, reliability, and manufacturing control and inspection. This work experience includes numerous gasoline and diesel engines, oil and lubrication systems, exhaust and emission systems, control modules, and sensors. I also have extensive experience related to automotive components and systems, supplier processes, assembly, and manufacture quality review and sign-off for concurrence to control plans, as well as engineering and manufacturing specifications. I have reviewed numerous supplier manufacturing and assembly processes,

implemented changes for quality and reliability improvement, to ensure compliance to engineering and manufacturing standards, so that components will function properly and reliably over long-term vehicle life, in both military and automotive applications. I am also thoroughly experienced in the related durability and reliability testing, specifications, and standards, and the proper assembly, manufacturing, and quality control (e.g., including those involving lean six-sigma applications and techniques). My responsibilities also include conducting and leading technology and material source trade studies and analyses using preset requirements for evaluation to ensure the selected alternatives meet or exceed the requirements and specifications for the components, system, vehicle, and overall mission system integration requirements as well as Department of Defense 5000 and 5001 protocols.

22. I also have extensive experience in the testing, development, and prove-out (including life-cycle, hot and cold temperature extreme, thermal-shock, humidity, salt spray testing, and fluid exposure testing, corrosion resistance, environmental testing, durability and reliability performance, etc.) for protection of automotive components. This includes extensive experience in automotive dealership and after-market service procedures, and also the for assessment of engines, and the related filters, oil and lubricants, and the associated seals, gaskets, plugs, fluid and oil drainage mechanisms, as well as proper service, replacement, and maintenance

procedures, including those for dealership and after-market service, replacement, diagnosis, and replacement.

23. I am also a classic car enthusiast and I have been personally working on all aspects of vehicles since before my high school auto shop days at Cass Technical High School in Detroit, Michigan, where I took auto shop for every semester for the four years of High School Education, and frequently worked on vehicles after school. This includes regular analyses, repair, and replacement of engines (diesel and gasoline), oil and filter components and systems, and vehicle components in numerous vehicles. I have personally performed hundreds of oil changes, drained the oil through drainage plugs, and replaced oil filters since I was 13 years old. Also for example, during my high school days, I personally restored and maintained a 1967 Mustang Fastback with a 289 engine and a 4 barrel carburetor and manual transmission. I also worked on numerous other vehicles (cars, trucks, motorcycles, small engines, etc.), including Chevrolets, Mopars, Fords, Foreign, General Motors, Chrysler, and other vehicles. My current projects are a 1969 Super Cobra Jet Mustang Mach 1, and a 1968 428 Cobra Jet Mustang.

24. As I stated previously, I am also a lean six sigma black belt, with extensive experience in manufacturing processes, quality control, and process improvement. I am thoroughly familiar with automotive, truck, and heavy vehicle and automotive engineering specifications, gas, diesel, hybrid, and electric vehicles, and

automotive product acceptance testing, control plans, PPAP, Failure Modes and Effects Analyses (FMEAs), and Design Validation Plans and Reports (DVPRs), as I have authored and released several of these documents and specifications, and approved components and systems verification verified and validated per these tests, specifications, and requirements.

25. My work, including my decades of experience as an automotive engineer and engineering manager, at Ford, General Motors, AlliedSignal, Raytheon, General Dynamics, and also with the U.S. Army, specifically involves the testing and development of the aforementioned systems. This includes laboratory tests, in-vehicle assessments, technology and prototype component assessments, proving-ground testing (I am certified as a Ford Level II test track driver), as well as product testing, development, and performance verification and validation and extreme hot and cold temperature performance, thermal shock, and life-cycle testing to improve and ensure overall performance, durability, and reliability, of these products and systems, and also to ensure proper design for service, maintenance and sustainability over long-term vehicle life, and also to mitigate environmental aspects and effects at disposal. My work also involves and has involved extensive inspection, investigation, and analysis of field events involving automotive systems. This includes evaluation of service procedures, service tools, and proper or improper service of vehicle components and systems, as performed by, for example, automotive dealerships, aftermarket accessory

shops, and repair shops. I have specifically performed numerous forensic investigations, evaluations, and assessments, as related to these evaluations and qualified to testify as an expert in state and federal courts throughout the United States.

26. My responsibilities include technology assessments and supplier and sourcing evaluation and selection, quoting and bidding, and overall source selection and the overall source selection process. For example, I specifically have prepared numerous extensive proposals and responses for many different domestic, European, Asian, and Pacific Rim requests for quotations (“RFQs”) in the hopes of winning awards as the Tier 1 supplier chosen for many original equipment manufacturer (“OEM”) programs. I was involved in both winning awards and non-winning awards on numerous programs for different OEMs. While at General Motors and Ford, and in my current position for the U.S. Army, I am part of, and also the leader of, many cross-functional teams involved in the sourcing selection, request for information (“RFI”) and RFQ processes and evaluations, and ultimate evaluation and decision as to which suppliers are chosen for purchase order (“PO”) awards on numerous vehicle programs.

27. My work also involved extensive inspection, investigation, and analysis of field events involving automotive systems. I have specifically performed numerous forensic investigations, evaluations, and assessments, and qualified to testify as an expert in state and federal courts throughout the United States. I also performed off-road analyses using numerous car and truck platforms under different

environmental extremes and conditions, including off-road performance and evaluation in Barstow, California. I also developed the testing specifications and requirements, as well as the standards and requirements for acceptable performance, for these aforementioned vehicle systems and components and directed how these tests are to be performed. I also conducted numerous environmental, humidity, drop, vibration, vehicle dynamics, thermal shock, EMC, and temperature tests (including conduction, convection, radiation thermal transfer and heat absorption), material emissivity/heat transfer, and established the environmental, temperature, vibration, (life cycle, temperature cycle, heat age, millivolt drop, wire & connector pull, drop testing, corrosion assessments, chemical/material analyses, oil & lubricant & filter degradation assessments, etc.) requirements for vehicle components and systems, including oil, fluids, lubricants, filters, oil filters, metals, plastics, coatings, electronic modules and sensors and their related specifications, to ensure proper system performance over long term vehicle life. In particular, I conducted live in-vehicle tests, over numerous on-road and off-road surfaces and conditions, and testing at environmental and operating extremes to establish proper requirements and their associated ranges for system and component specifications, DVPRs and subsystem design specifications, and life-cycle tests. I also developed and verified the manufacturing In-Process tests and Control Plans to ensure component manufacturing within proper reliability and confidence interval requirements, as well as life-cycle

testing for reliability over long-term vehicle life. My current responsibilities, as well as my previous work at Ford, General Motors, AlliedSignal, Raytheon, and General Dynamics, include the development of requirements, specifications, quality, reliability, process, manufacturing and compliance standards, control plans, Failure Mode and Effects Analyses (FMEA), Failure Analysis and Corrective Actions Reports (FRACAS), root cause analyses, application of six sigma techniques, 8 discipline and 14 discipline reports for automotive/military ground vehicle systems and components and the proper service tools, instructions, procedures, safety, and warnings.

28. I also have conducted extensive forensic analyses and have extensive related testifying experience in product liability matters, including assessment of proper service procedures and tools, and the related improper service claims and/or product defect claims that involve death and serious injury. This work includes analyses and assessment of service tools, service procedures/instructions, safety/warnings, diagnostic/assessment evaluations, and forensic physical evidence. In many of these matters, I have determined whether or not proper service was rendered, whether or not proper service tools and diagnostic assessments procedures and instructions were followed, and/or whether or not design issues are present as to the root cause of the vehicle issues present. As I stated previously, I have also developed service procedures, instructions, illustrations, drawings, and service tools, and also engineered the design and or service alteration to mitigate and prevent the issue from

occurring in the field. For example, while at Ford Motor Company I conducted numerous field investigations and assessments, including at dealerships and service shops, and after-market accessory shops, determined causation, and then made design change recommendations for mitigation of the safety risk, safe vehicle design, and safe vehicle service.

29. My work over the years has also included analyses involving statistical information from government databases, including the National Automotive Sampling System (“NASS”) and Fatality Analysis Reporting System (“FARS”) databases. My work also involved extensive inspection, investigation, and analysis of field accidents and field events involving product defect investigations and assessment of safe and proper design, proper vehicle service instructions, procedures, service tools, design for service, design for assembly. I have performed numerous forensic investigations and real-world assessments of vehicle events including vehicle service in the field as part of my investigations. I have also specifically performed forensic investigations, evaluations, and assessments, regarding causation related to vehicle service tools, service procedures, diagnostics and assessments, system and component faults, and proper or improper use of service tools, proper or improper service procedures, and/or vehicle component and system design in product liability claims, and warranty claims.

30. I have testified as an expert in numerous cases involving automotive components and systems, including service tools, and procedures, safety systems, and

compliance to regulations, standards, and specifications. I have conducted numerous system and component evaluations, laboratory tests, quality and reliability evaluations, and extensive field event analyses, forensic investigations, vehicle and component inspections, accident reconstructions, assessment of proper or improper service procedures and service tools, assessment of system and component failures, and material failures, and determined causation and root cause analyses for hundreds of cases. I have extensive experience in equipment process quality compliance, process improvement, process waste reduction, process cost reduction, process optimization and improvement. I have also served as an expert witness and corporate representative regarding components and systems, proper design, development, and manufacturing, as well as process (e.g. manufacturing, assembly, decontamination, quality control, proper or improper service tools/procedures, Lean Six Sigma application, full and partial factorial design of experiments) review, improvement, and control. Further details of my background and training are contained in my attached Curriculum Vitae.

III. MATERIALS REVIEWED

31. The opinions contained in this Declaration are based on the documents I reviewed, my professional judgment, as well as my education, experience, and knowledge.

32. In forming my opinions expressed in this Declaration, I reviewed all of the exhibits included with the filing of the Petition as well as any other documents cited in this declaration.

33. My opinions have also been guided by my appreciation of how a person of ordinary skill in the art would have understood the state of the art, the prior art, and the claims and the specification of the '203 patent at the time of the alleged invention.

IV. LEGAL STANDARDS

34. Petitioners' attorneys have explained to me the legal standards that apply in this case. My understanding of those standards is described below. I have used my understanding of the following legal principles set forth in this section in reaching my opinions.

35. I understand that, in this proceeding, Petitioners have the burden of proving that the challenged claims are invalid by a preponderance of the evidence.

A. Obviousness

36. I have been informed that a claim is invalid as obvious under 35 U.S.C. § 103 (pre-AIA) if the differences between the claimed subject matter and the prior art are such that the subject matter as a whole would have been obvious at the time of the invention to a person of ordinary skill in the art. I have been informed that the following matters are relevant to determining whether the claimed invention would have been

obvious: (1) the scope and content of the prior art, (2) the difference or differences between the patent claim and the prior art, (3) the level of ordinary skill in the art at the time the invention of the patent, and (4) any secondary considerations or objective indicia of non-obviousness.

37. I have been informed that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. When a claim simply arranges prior art elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, then such a combination is obvious. When a patent claims a structure already known in the prior art altered by the mere substitution of one element for another known in the field, the combination is likely to be obvious unless the combination yields an unpredictable result.

38. I have been informed that when a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill in the art can implement a predictable variation, such a variation is likely unpatentable. For the same reason, if a technique has been used to improve one device, and one of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. One

question to consider is whether the improvement is more than predictably using prior art elements according to their established functions.

39. I have been informed that it may often be necessary, in a validity analysis, to consider whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. This can be accomplished by looking to interrelated teachings of multiple patents or other publications or pieces of prior art; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by one of ordinary skill in the art.

40. I have been informed that a validity analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim; it is appropriate to take account of the inferences and creative steps that a person of ordinary skill in the art would employ. I have been informed that a person of ordinary skill in the art is a person of ordinary creativity, not an automaton.

41. I have been informed that a claim composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art. I have been informed that it can be important to identify a reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does. I am told that one way that subject matter can be proved obvious is by noting there existed at the time of

the invention a known problem for which there was an obvious solution encompassed by the patent's claims. I have been informed that any need or problem known in the field of endeavor at the time of the claimed invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.

42. I have been informed that one should not assume that a person of ordinary skill in the art attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem. Instead, I have been informed that since familiar items may have obvious uses beyond their primary purposes, in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple prior art references together like pieces of a puzzle.

43. I have been informed that, when there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, persons of ordinary skill in the art have good reason to pursue the known options within their technical grasp. If this leads to the anticipated success, the product was likely not accomplished by innovation but by using ordinary skill and common sense. I have been informed that, in such an instance, the fact that the combination was obvious to try may show that the combination was obvious.

44. I have been informed that, when determining whether a claimed combination would have been obvious, the correct analysis is not whether a person of ordinary skill in the art, writing on a blank slate, would have chosen the particular

combination of elements described in the claim. Instead, I have been informed that the correct analysis considers whether one of ordinary skill, facing the wide range of needs created by developments in the field of endeavor, would have seen a benefit to selecting the combination claimed.

45. I have been informed that, when determining whether a claimed invention is obvious, any “secondary considerations” of non-obviousness identified by the patentee should also be considered. These secondary considerations can include:

- commercial success of the invention, causally related to the invention itself rather than to companion factors, such as advertising or attractive packaging;
- the invention taught away from the technical direction followed by those skilled in the art;
- a long-felt but unsatisfied need for the invention while the needed implementing arts and elements had long been available;
- the invention achieves results unexpected to those skilled in the art;
- copying of the invention by competitors as distinguished from their independent development

- unsuccessful attempts by those skilled in the art to make the invention;
- acquiescence by the industry to the patent's validity by honoring the patent through taking licenses or not infringing the patent, or both; and
- skepticism, disbelief in or incredulity by those skilled in the art that the patentee's approach worked.

46. I have been informed that, for the above information to impact the obviousness of a patent claim, there must be a nexus between the alleged secondary considerations and the claims. In addition, I have been informed that the burden of introducing evidence of secondary considerations generally is on the Patent Owner. If the Patent Owner or its expert should assert secondary considerations of non-obviousness, I reserve the right to provide a Declaration addressing assertions of non-obviousness due to secondary considerations.

B. Claim Construction

47. I have been informed that claim terms are typically given their plain and ordinary meanings, as would have been understood by a person of ordinary skill in the art at the time of the earliest alleged priority date. I have further been informed that when considering the meaning of any terms in the Challenged Claims of the '203

patent, I should apply the plain and ordinary meaning of those terms. I have further been informed that in considering the meaning of the claims, one must consider the language of the claims, the specification, and the prosecution history of record.

48. I have been informed that in general, a preamble limits the invention if it recites essential structure or steps, or if it is necessary to give life, meaning, and vitality to the claim. I have further been informed that a preamble is not limiting where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention. I have further been informed that dependence on a particular disputed preamble phrase for antecedent basis may limit claim scope because it indicates a reliance on both the preamble and claim body to define the claimed invention. I have further been informed that clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art transforms the preamble into a claim limitation because such reliance indicates use of the preamble to define, in part, the claimed invention.

V. PERSON OF ORDINARY SKILL IN THE ART AND THE TIME OF THE ALLEGED INVENTION

49. I have been asked to assume that the '203 patent is entitled to its earliest alleged priority date of December 10, 2009. *See* Ex. 1001. Beyond this assumption, I have not undertaken an analysis to determine the earliest priority date to which the '203 patent is entitled.

50. Based on the materials and information I have reviewed and based on my experience in the technical areas relevant to the '203 patent, a person of ordinary skill in the art at the time of the alleged invention of the '203 patent would have at least a master's degree in chemical, electrical, mechanical, or automotive engineering, and at least two or more years of experience in the automotive industry designing, developing, testing, and engineering automotive components or practical experience servicing, assembling, repairing, and/or developing internal combustion engines and/or engine oil filters (or equivalent experience). More education can supplement practical experience and vice versa. Based on my knowledge and experience, including as discussed above in Section II, I was a person of ordinary skill in the art at the time of the alleged invention of the '203 patent and can provide opinions regarding the knowledge of a person of ordinary skill in the art as of that time. My opinions herein are, where appropriate, based on my understandings as to a person of ordinary skill in the art at that time. I myself had these capabilities at the time of the alleged invention of the '203 patent.

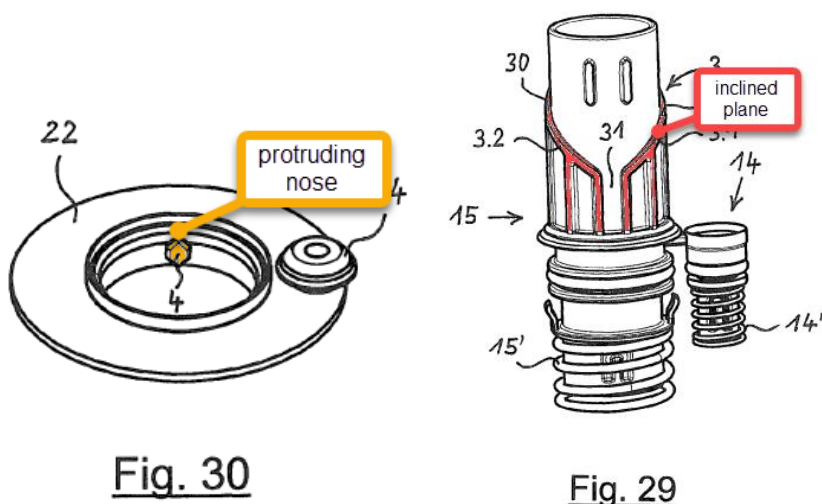
VI. The '203 patent

A. Description of the '203 patent's Specification

51. U.S. Pat. No. 9,023,203 (the "'203 patent") is directed to a liquid filter for automotive use (such as an oil filter) where the filter includes a "filter housing" and a "filter insert" (which performs the actual liquid filtering) that is inserted into the

housing. Ex. 1001, Abstract; 1:5-10. The '203 purports to introduce a novel method of inserting the filter insert in such a way that the insert is correctly oriented into the filter housing. The '203 accomplishes this through the use of a protrusion/inclined plane guiding mechanism, where the protrusion is either on the filter housing or the insert, and the inclined plane is on the other. The guiding mechanism allows the filter insert to rotate within the housing into the correct orientation.

52. Although such guiding mechanisms were known in the art, the '203 patent claims a specific mechanism where the protrusion/inclined plane are located in the hollow hole portion of the filter insert. One of the protrusion or inclined plane is on the outer circumference of a filter housing nozzle that is inserted into the inner portion of the filter insert, and the other is on the inner circumference of the filter insert. This is illustrated in the below figures:

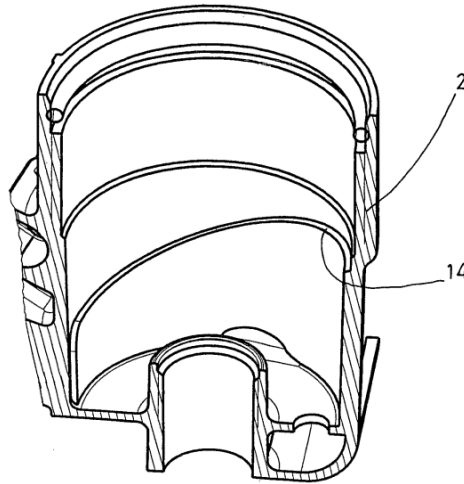


B. The '203 patent's Prosecution History

53. I have reviewed the prosecution history of the '203 patent.

54. During prosecution of the '203 patent, the examiner did not issue any rejections. Instead, the examiner stated in the notice of allowance that German application DE202007001227 ("DE-227"), an earlier foreign patent filed by Patent Owner Hengst, is "the closest prior art." Ex. 1002, 131. The examiner further stated that while DE-227 taught a nose and inclined plane, that it "does not teach the inclined plane or nose being arranged on either of the inner circumference of the ring filter insert or the outer circumference of a filter housing part arranged inside the ring filter insert nor would it have been obvious to one of ordinary skill in the art." Ex. 1002, 131; *see* limitation 1[l] and 1[m] (and corresponding analysis in the Grounds).

55. In DE-227, the inclined plane is on the inner circumference of the shell of filter housing and the nose is on the outer circumference of the filter insert, essentially the opposite of what the '203 claims. *Id.*, 305. For example, Figure 3 below from DE-227 shows the inclined plane 14 being on the inner circumference of the shell filter housing.



C. Interpretation of the '347 Challenged Claims

56. For the purposes of my analysis in this IPR proceeding, I understand that the words of a claim are given their plain meaning that those words would have had to a POSITA at the time of the alleged invention. I also understand that the structure of the claims, the specification, and the prosecution history may also be used to better construe a claim insofar as the plain meaning of the claims cannot be understood. Moreover, I understand that even treaties and dictionaries may be used, albeit under limited circumstances, to determine the meaning attributed by a POSITA to a claim term at the time of filing. Furthermore, I understand that a Patent Owner's own apparent interpretation of certain terms in related proceedings can be considered to determine the meaning of patent claims in an IPR proceeding.

57. I have followed this approach in my analysis, and, except as discussed below, I have applied the plain and ordinary meaning of those terms as they would have been interpreted by a POSITA at earliest filing date of the '203 patent.

58. Independent Claims 1 and 15 both recite two terms that contain the word “means.” Claim 1 recites “first and second interacting positioning means” and claim 15 recites “first” and “second” “positioning means.” I have been informed that the term “means” is typically considered a “nonce” term that carries a strong presumption that the term is a “means-plus-function” term that must have a function recited in the claims and must have a corresponding structure recited in the specification. I have been informed that—unlike with terms which receive a plain and ordinary meaning—the full scope of a “means-plus-function” term is the corresponding structure found in the specification and any equivalents.

59. I have also been informed that a “means” term is not a “means-plus-function” term if the language of the claims provide sufficient structure. I have also been informed that a “means” term is not a “means-plus-function” term if it lacks a recited function. In my opinion, the “means” terms in claims 1 and 15 have sufficient structure within the claim limitations. It is also my opinion that they lack a recited function. Thus, I do not think they are means-plus-function terms. However, in the event Patent Owner argues that the terms should be construed as means-plus-function terms, below I identify the corresponding structure within the specification.

60. Claim 1 recites a “first and second interacting positioning means.” Claim 15 requires a “first” and “second” “positioning means.”

61. In my opinion, Claim 1 recites sufficient structure for the first and second interacting positioning means. Claim 1 recites that the “first interacting positioning means” comprises an “***inclined plane***” that is “on one of the ring filter insert and the filter housing.” Likewise, the “second interacting positioning means” includes “***a protruding nose***” that is “arranged opposite the inclined plane.” Claim 1 further explains that these “inclined plane and nose” are “arranged to be movable in relation to each other in such a way that they slide along each other ... [when] rotating the ring filter insert relative to the filter housing.” Claim 1 goes on to recite that the blocking element engages with the opening when the nose and inclined plane “slide along each other,” which makes clear that the arrangement of the first and second interacting positioning means is a structural arrangement, and not a matter of function requiring structure defined in the specification. Either the inclined plane or nose is on the “inner circumference of the ring filter insert” and the other is on the “outer circumference of a filter housing part arranged inside the ring filter insert.” Finally, Claim 1 recites that the inclined plane “excludes a self-locking.” In my opinion, these are all limitations that are directed to the structure of the first and second interacting positioning means, and together constitute sufficient structure for those limitations.

62. It is also my opinion that these limitations do not recite a function for the first and second interacting positioning means. These is because the limitations do not say they are a “means for” a particular function as how such claims are normally recited. Instead, the claims simply state that the means are “arranged to bring the blocking element into engagement with the eccentric opening when the ring filter insert is inserted into the filter housing.” In my opinion, this is not function, it is simply additional structure.

63. My opinion is similar for Claim 15. Claim 15 recites a “first” and “second” positioning means which are very similar to the means recited in claim 1. The first positioning means is “on the ring filter insert” and “interact[s] with second positioning means on the filter housing when the ring filter insert is inserted into the filter housing.” The first positioning means is either an inclined plane or a protruding nose, and the second positioning means is the other. Like in Claim 1, they are “arranged to be moved in relation to each other in such a way that they slide along each other ... by rotating the ring filter insert relative to the filter housing.” The first positioning means is also “embodied [or] arranged on an inner circumference of the ring filter insert.” As with Claim 1, it is my opinion all of these limitations provide structure to the first and second positioning means and a POSITA would have considered them sufficient structure. I also believe neither positioning means has any recited function. A POSITA would understand that the first positioning means being

“arranged to bring the blocking element into engagement with the eccentric opening ... by rotating the ring filter insert relative to the filter housing” is a structural arrangement, not a functional one.

64. In addition, it is my opinion that claim 15 does not recite a function for the claimed “second positioning means” because claim 15[c]’s recitation of an arrangement to bring the blocking element into engagement with the opening only applies to the “first positioning means,” not the “second positioning means”: “first positioning means ... **which interact** with second positioning means ... and **which are** arranged to bring the blocking element ...” Thus, it is my opinion that neither term is a means-plus-function term.

65. However, to the extent Patent Owner argues otherwise, below I provide what I believe would be the corresponding structure for these means terms. I also provide what I think would constitute the closest to the recited function, even though as I explain above, I do not believe these terms have recited function.

66. For “**first interacting positioning means**” from claim 1, the closest recited function is “to bring the blocking element into engagement with the eccentric opening when the ring filter insert is inserted into the filter housing.” In my opinion, the corresponding structure to that recited function is 7:9-12, 7:17-22, 7:40-61, 8:10-15, 8:27-51, 8:63-67, 12:14-26, 12:41-45, 14:34-51, 14:60-64, Figs. 3, 4, 6, 7, 29, 37, and equivalents.

67. For “*second interacting positioning means*” from claim 1, the closest recited function is the same as the first interacting positioning means, *i.e.* “to bring the blocking element into engagement with the eccentric opening when the ring filter insert is inserted into the filter housing.” In my opinion, the corresponding structure to that recited function is 3:40-42, 7:12-14, 7:17-22, 8:33-51, 8:63-67, 12:36-45, 14:12-20, 14:60-64, Figs. 8, 30, 35, and equivalents.

68. For “*first positioning means*” from claim 15, the closest recited function is “to bring the blocking element into engagement with the eccentric opening.” Since claim 15 states that the first positioning means could be an inclined plane *or* a protruding nose (with the second positioning means being the other), the corresponding structure is dependent on which element those means are. If the first positioning means is an inclined plane, the corresponding structure is 7:9-12, 7:17-22, 7:40-61, 8:10-15, 8:27-51, 12:14-21, 14:42-51, Figs. 3, 4, 6, 7, 29, 37, and equivalents. If the first positioning means is a protruding nose, the corresponding structure is 3:40-42, 7:12-14, 7:17-22, 8:33-51, 12:36-45, 14:12-20, Figs. 8, 26, 30, 35, and equivalents.

69. For “*second positioning means*” from claim 15, I do not believe there is any recited function. However, the closest recited function is the same as the “first positioning means,” that is, “to bring the blocking element into engagement with the eccentric opening.” If the second positioning means is an inclined plane, the corresponding structure is 7:9-12, 7:17-22, 7:40-61, 8:10-15, 8:27-51, 12:14-21, 14:42-

51, Figs. 3, 4, 6, 7, 29, 37. If the second positioning means is a protruding nose, the corresponding structure is 3:40-42, 7:12-14, 7:17-22, 8:33-51, 12:36-45, 14:12-20, Figs. 8, 26, 30, 35, and equivalents.

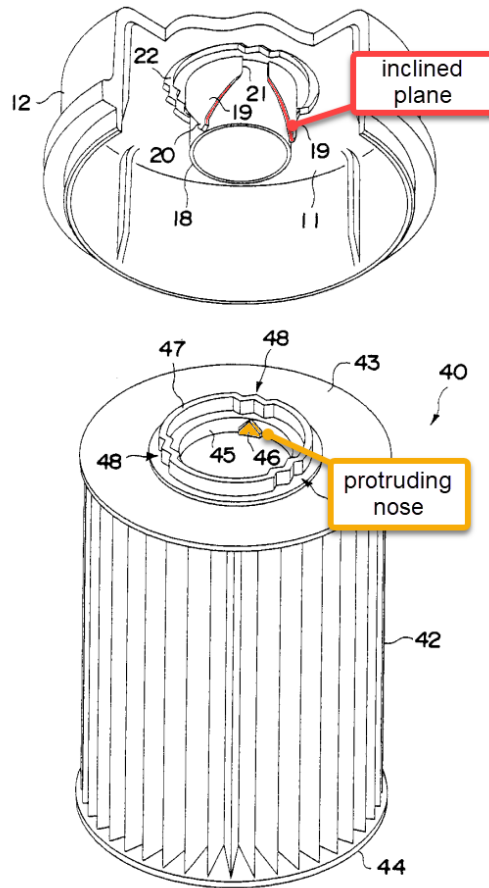
VII. SUMMARY OF THE PRIOR ART

70. I provide a summary of the primary prior art references I rely on. Each reference relates to oil filters and describes an oil filter insert that goes into an oil filter housing. In my opinion, all of these references would be sources that a POSITA would have considered when seeking to improve upon prior oil filtration designs.

A. Yokoyama (Ex. 1008)

71. Japanese Application No. 2002-313171 to Yokoyama *et al.* (“Yokoyama”) was published on May 13, 2004 with publication number 2004-136203. Ex. 1007. A certified translation of Yokoyama is provided at Exhibit 1008.

72. Yokoyama provides “a filter device having a structure in which a filter element can be easily assembled into a filter case.” Ex. 1008, Abstract. It provides “[o]ne or more locking protrusions 46” on the inside of a filter insert, and “pleated portions 19” on the “outer periphery of the pipe portion 10” of the filter housing. *Id.* The protrusions slide along the pleated portions to properly orient the filter insert, and a sealing element enters a groove to seal the two. *Id.*, ¶20.



B. Honermann (Ex. 1006)

73. U.S. Patent Application No. 2010/0044295 (“Honermann”) was filed on April 25, 2008. Like Yokoyama, Honermann also discloses a filter housing that accepts a filter insert that can be rotated along a guide mechanism to be properly oriented. Ex. 1006, 1:12-14; Fig. 3.

75. The filter insert has “a protrusion arrangement 118” which slide along the slide surfaces of the basket to “ensure[] protrusions and slide surfaces operate as a “lock-out mechanism” that “ensures that the filter system 30 cannot be operated unless the filter cartridge 38 has been operably assembled within the filter bowl 36.” Ex. 1006, ¶¶98, 174, 178.

C. Deschamps (Ex. 1010)

76. U.S. Patent Application Publication No. 2012/0261326 (“Deschamps”) was filed on August 31, 2010 and claims priority to a German application filed on October 20, 2009.

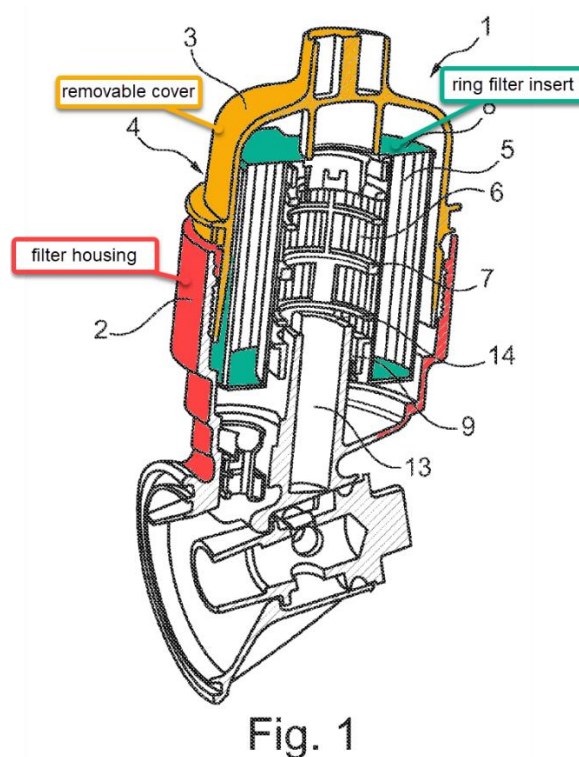
77. I understand that Petitioners are not relying on Deschamps in its grounds of challenge. However, Deschamps was filed several months before the ’203 patent and therefore is evidence of what was known by a POSITA.

78. I have been informed that Patent Owner has asserted that Deschamps is not prior art because its international application was not published in English, which I have been informed is a requirement for asserting a reference is prior art under pre-AIA Section 102(e). I do not provide any opinion as to whether or not Deschamps is prior art. However, I understand that because Deschamps was filed before the ’203 patent and was published in 2011, it is evidence of the knowledge of a POSITA at the time of the ’203 patent. And it is my opinion that at least the disclosures in Deschamps

regarding the inclined plane/protruding nose guidance mechanism and the eccentric valve mechanism were known by a POSITA at the time of the '203 patent.

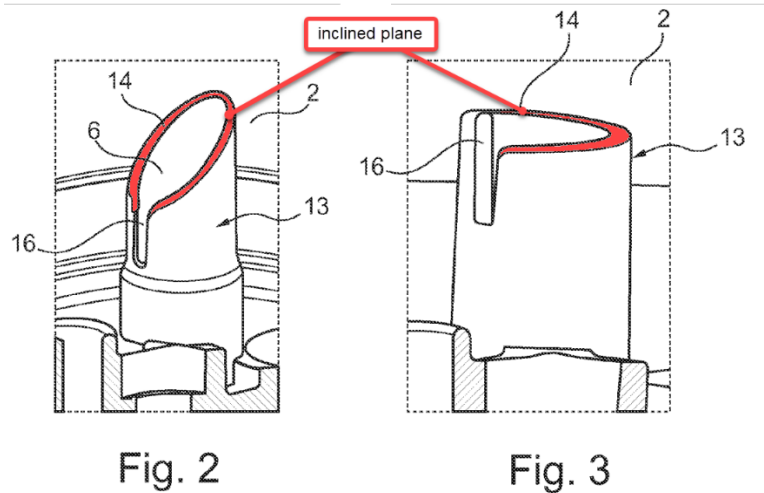
79. I therefore provide the below summary of Deschamps. I also provide an analysis in Section XI below concluding that Deschamps, if it was prior art, at least renders obvious the independent claims of the '203 patent.

80. Deschamps discloses “a filter device, in particular an oil or fuel filter,” which has a filter housing and a ring filter element that is inserted into the housing and rotated. Ex. 1010, ¶¶2, 33; Fig. 1. Below, I have provided an annotated version of Figure 1 depicting these components.

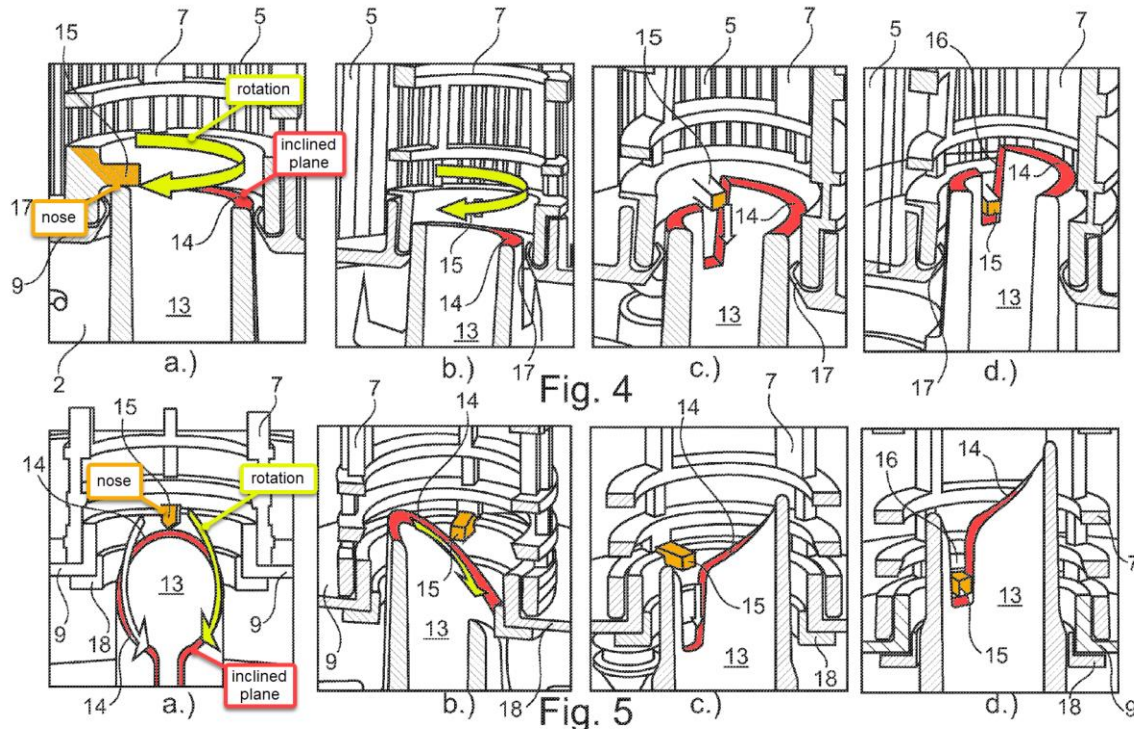


81. Deschamps discloses that the center of the housing has a protrusion called a “tube-shaped dome 13.” Ex. 1010, ¶34. At the “free end of the said tube-

shaped dome 13” is a “guide contour 14” which is an inclined plane. *Id.* Below I have provided an annotated Figure 2 and Figure 3 depicting the inclined plane at the end of the dome protrusion.

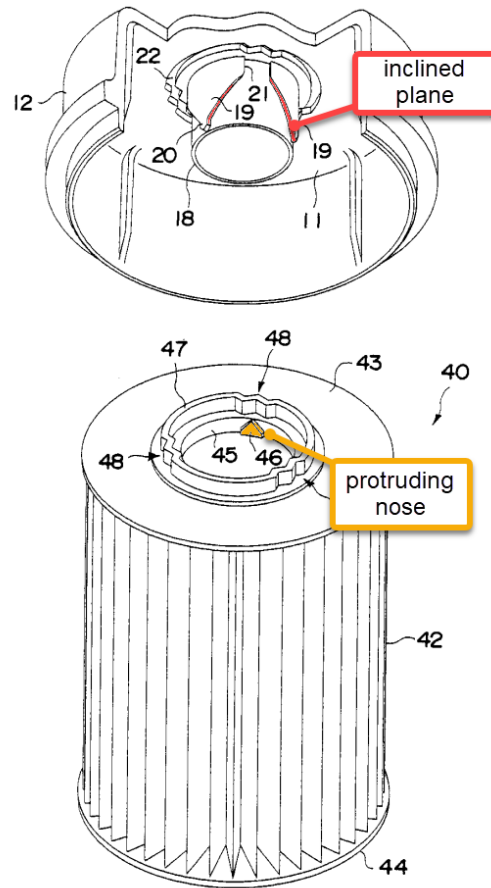


82. On the inner circumference of the filter insert is a protruding nose that Deschamps calls a “guide element 15,” which slides along the inclined plane (or guide contour 14) as the filter insert is rotated. Ex. 1010, ¶¶35-36. When the protrusion meets the bottom of the plane, it will enter the axial groove 16, allowing the filter insert to be properly oriented and inserted into the housing. *Id.* This will also cause a pin 10 on the insert to seal a channel 11 on the housing. *Id.* The below annotated Figures 4 and 5 show two embodiments for how the protruding nose slides along the inclined plane as the insert is rotated.

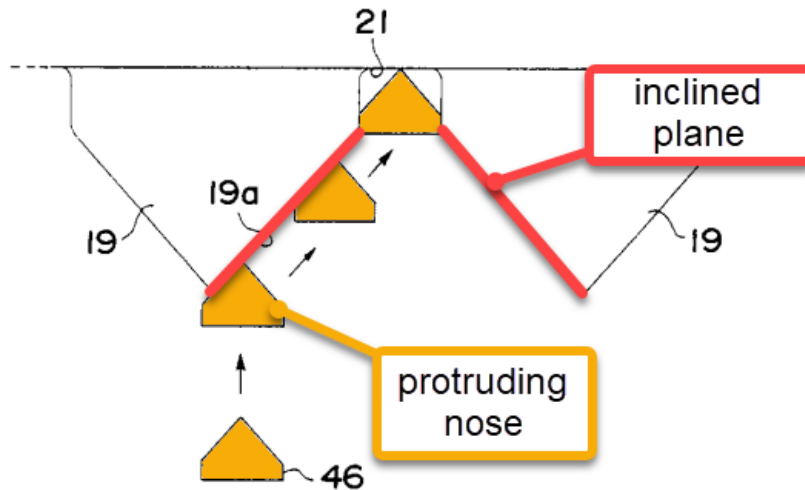


VIII. GROUND 1: YOKOYAMA RENDERS OBVIOUS CLAIMS 15-17, 19, 23, 25, 30

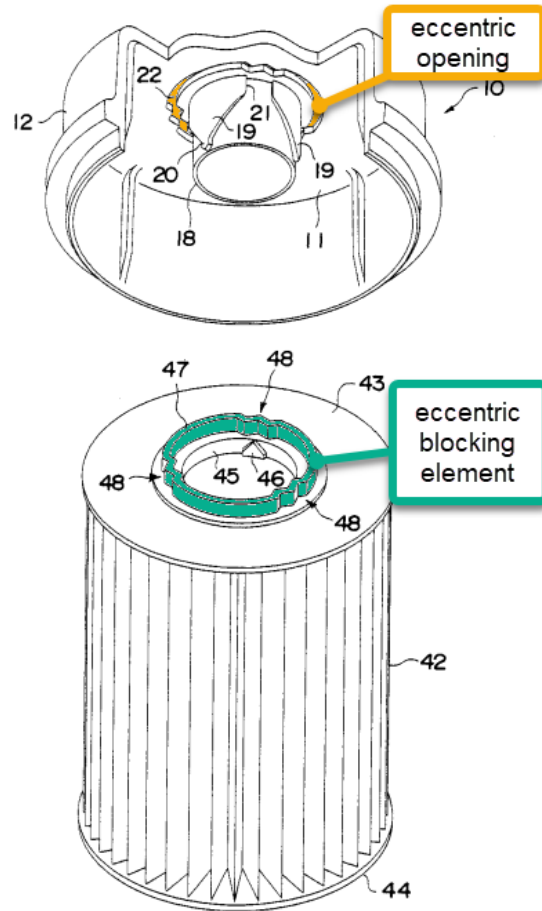
83. I first begin with a short summary of Yokoyama. Yokoyama discloses a “filter element 40” that is inserted into a filter housing to filter liquids such as oil or fuel. In order to properly orient the filter element within the filter housing, Yokoyama describes “locking protrusions” (*i.e.* protruding noses) that are in the inner circumference of the filter element. Yokoyama also describes “pleated portions 19” (*i.e.* inclined planes) which are on the outer circumference of a “pipe portion 18” in the filter housing. These components are shown below in the annotated Figure 1.



84. When the filter element is inserted, the protruding nose slides along the inclined plane in order to guide the filter element to the correct orientation. This sliding mechanism is illustrated in Figure 6.



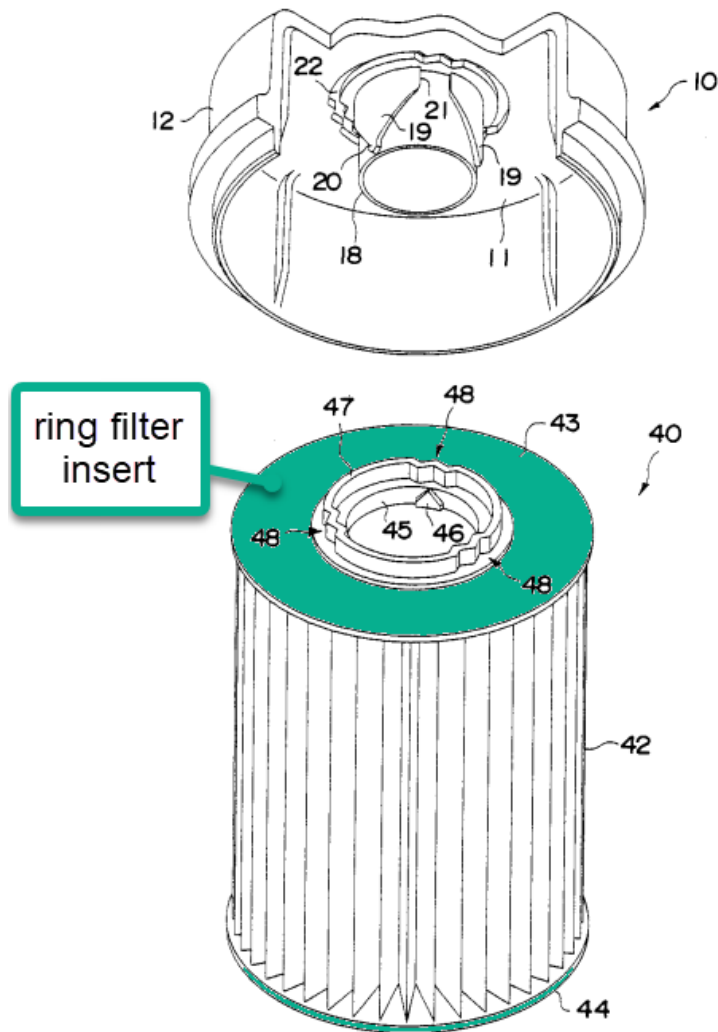
85. When the filter element is properly inserted into the filter housing, a “sealing member 47” (*i.e.* blocking element) on the filter element engages with “grooves 22” (*i.e.* opening) in the filter housing to provide a seal to keep the filter element and filter housing attached.



A. Claim 15

15[pre]: A ring filter insert for a liquid filter, comprising

86. In my opinion, Yokoyama discloses this limitation. For example, Yokoyama discloses a “filter element 40” which I show in the annotated Figure 1 below is a **ring filter insert for a liquid filter**. Ex. 1008, ¶19. The filter element 40 can be inserted into a “filter device.” *Id.*, ¶13.

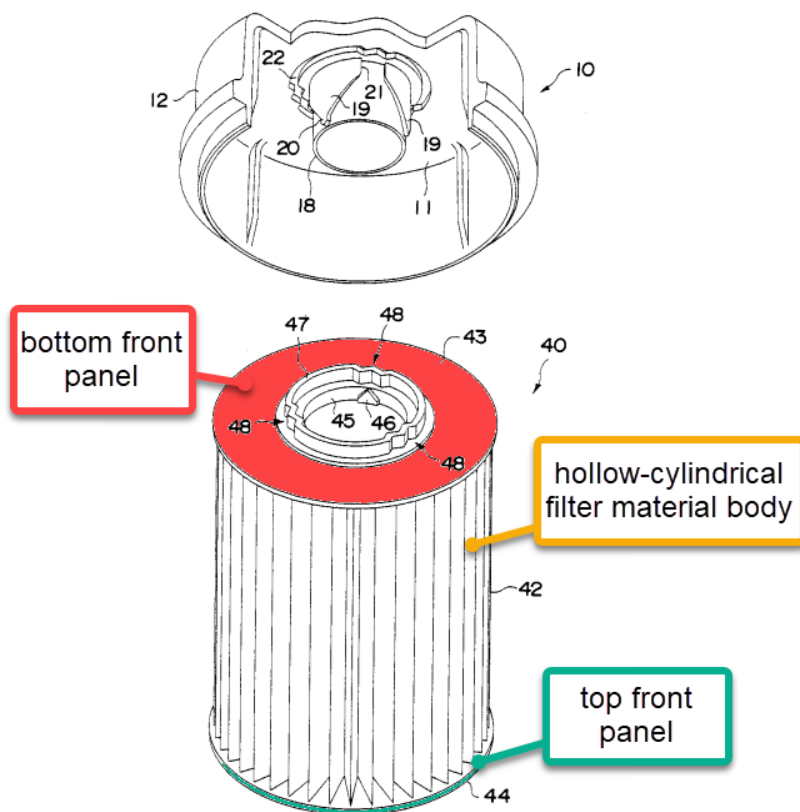


15[a]: A hollow-cylindrical filter material body surrounded on front sides by top and bottom front panels and which can be replaceably arranged in a filter housing,

87. In my opinion, Yokoyama discloses this limitation.

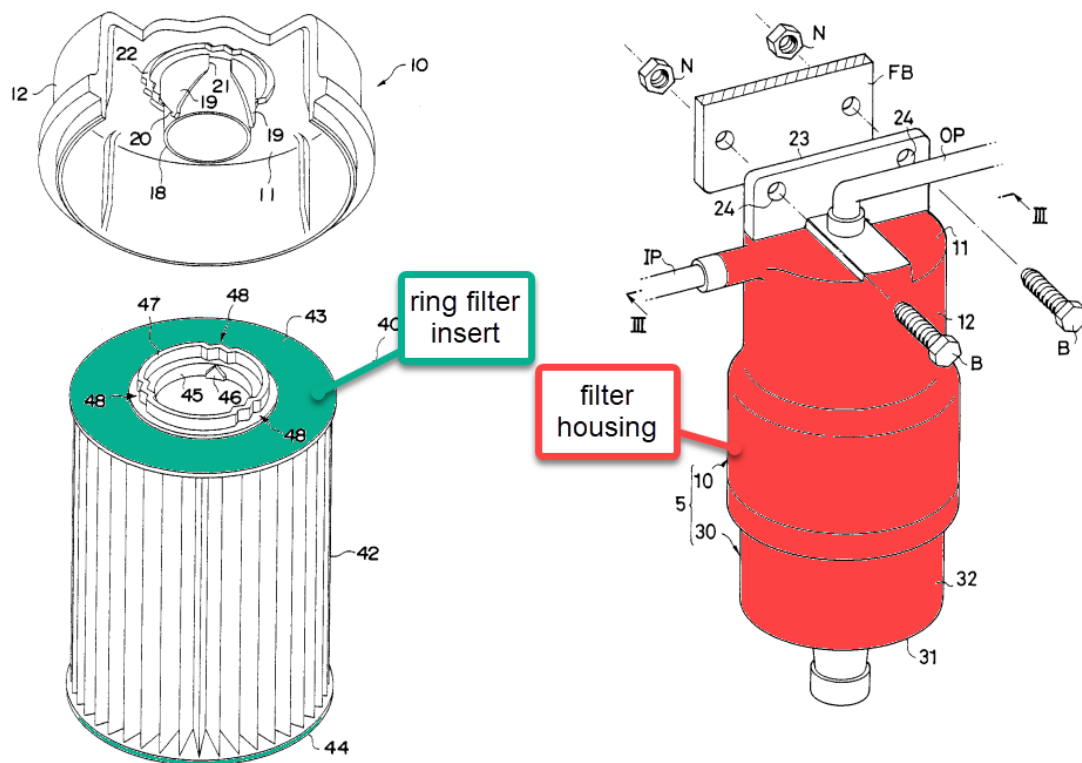
88. With respect to ***“A hollow-cylindrical filter material body surrounded on front sides by top and bottom front panels”***, as I show below in the annotated Figure 1, Yokoyama discloses a hollow-cylindrical filter material body surrounded on front sides by top and bottom front panels.

Although Yokoyama depicts the **top front panel** on the bottom of the filter medium and the **bottom front panel** on the top of the filter medium, in my opinion, a POSITA would understand that this merely reflects the orientation of the filter medium as depicted, and the orientation of the insertable filter medium could be upside-down. Moreover, a POSITA would understand that the entire filter device would operate in an identical manner if upside-down. This is because it is known that a filter device uses pressure to allow the flow of liquid through the device. This pressure is sufficient enough to allow the device to operate in either orientation.



92. With respect to the term “*which can be replaceably arranged in a filter housing,*” in my opinion, Yokoyama discloses that the filter element 40 (i.e. *ring*

filter insert) is **replaceable**. Ex. 1008, ¶26 (“The filter element 40 is a consumable item, and when the filter medium 42 becomes clogged or a predetermined period of time has elapsed, it is necessary to ... **replace it**.”). Yokoyama also discloses that the filter element is **arranged in the filter housing**, specifically that it is “installed ... in the filter case 5” of the filter device, which comprises “case halves 10 and 30.” *Id.*, ¶13.

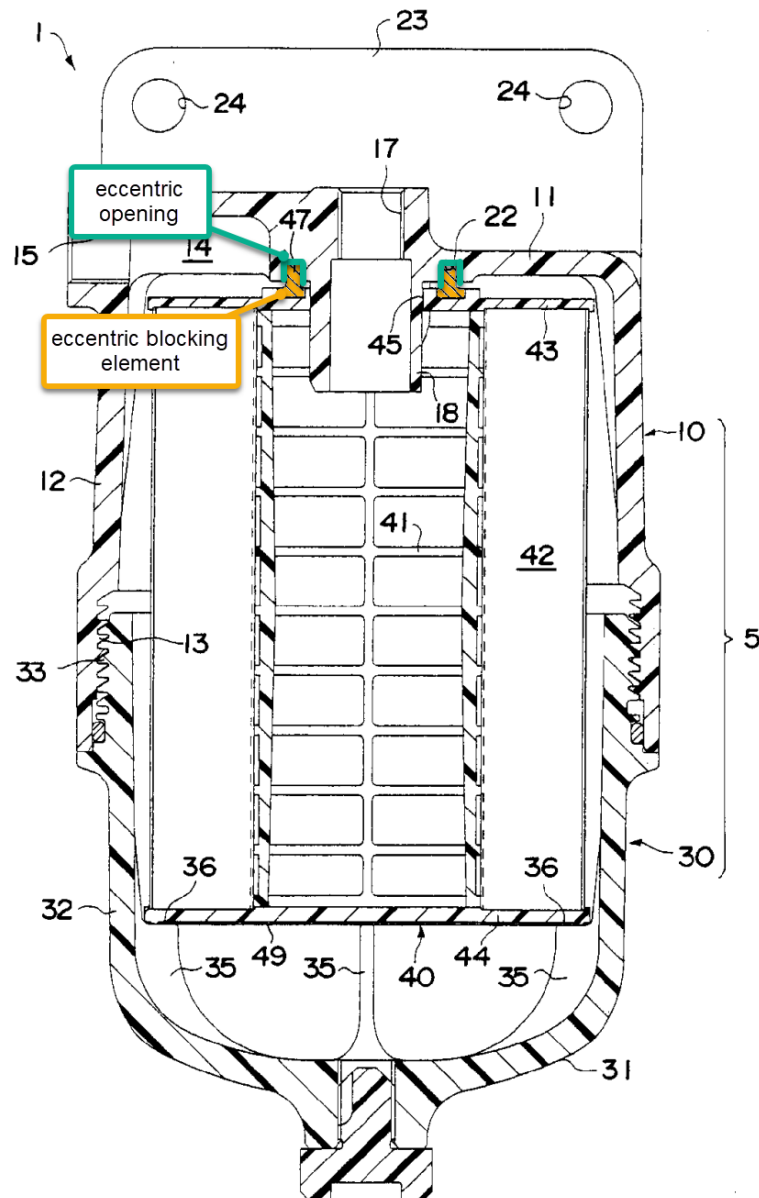


15[b]: an eccentric blocking element arranged on the bottom front panel for engaging an eccentric opening in the filter housing,

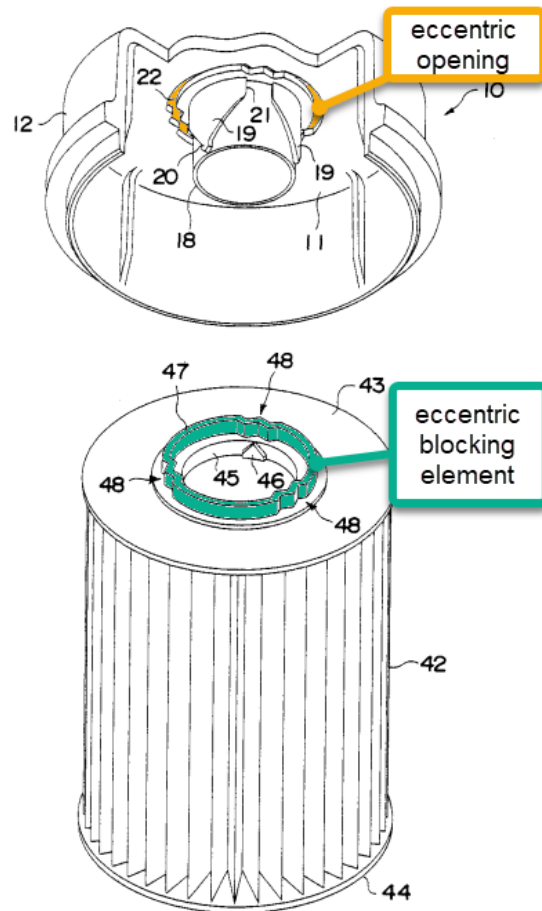
93. In my opinion, Yokoyama discloses this limitation. For example, Yokoyama discloses that “sealing member 47” is **an eccentric blocking element** that

engages with “grooves 22,” which is *an eccentric opening*, as shown in the below annotated figures.

94. The below Figure 3 which I have annotated depicts the blocking element and opening as eccentric.



95. Figure 1 also depicts the eccentric opening and blocking element.



96. In my opinion, a POSITA would understand that the blocking element and opening are ***eccentric*** because they are not located at the center of the filter insert or housing. To the extent Patent Owner argues that they are not eccentric because the axis of those elements is in the center of the housing, I disagree. For example, if the blocking element only consisted of the “W-shaped portions 48” and the opening only consisted of the corresponding W-shaped portions, then each W-shaped portion would undeniably be eccentric. The presence of additional portions of the blocking element/opening does not change this property of the W-shaped portions. Thus, at the

very least, one of the W-shaped portions and its corresponding W-shaped channel is eccentric.

97. Yokoyama discloses that “a ring-shaped sealing member 47 is provided on the upper surface side of the upper plate 43,” *i.e. arranged on the bottom front panel*. Ex. 1008, ¶20. The grooves are “provided on the lower surface side of the ceiling portion 11 in the upper case half 10,” *i.e. in the filter housing*. *Id.* Yokoyama teaches that “when the filter element 40 is attached to the upper case half 10, the sealing member 47 ... is fitted into the grooves 22,” *i.e. the blocking element engages with the opening*. *Id.* Thus, all limitations are met by Yokoyama.

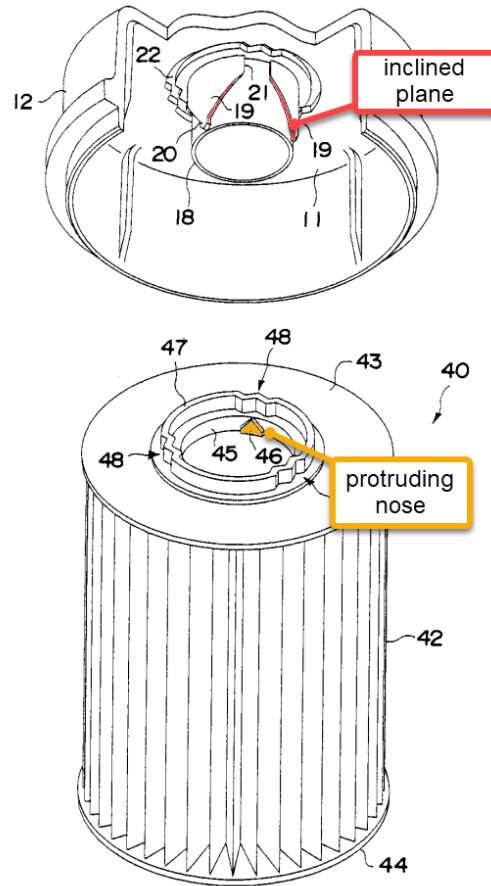
15[c]: first positioning means on the ring filter insert, which interact with second positioning means on the filter housing when the ring filter insert is inserted into the filter housing and which are arranged to bring the blocking element into engagement with the eccentric opening,

15[d]: the first positioning means being one of an inclined plane and a protruding nose, with the second positioning means being the other of the inclined plane and the protruding nose,

98. In my opinion, Yokoyama discloses these limitations. I put these limitations together because 15[d] specifies that the first positioning means (which is on the ring filter insert) can be either an inclined plane or a protruding nose, and the second positioning means (which is on the filter housing) is the other.

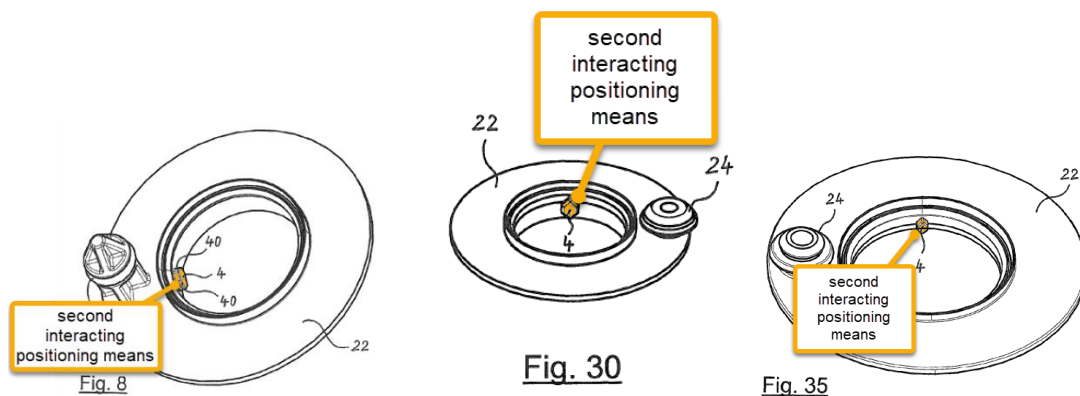
99. Yokoyama discloses a first positioning means in the form of a protruding nose on the ring filter insert, and a second positioning means in the form of

an inclined plane on the filter housing. These are depicted below in the figure below which I have annotated:



100. With respect to a ***“first positioning means on the ring filter insert ... being ... a protruding nose,”*** Yokoyama discloses a ***protruding nose on the ring filter insert***, specifically a “locking protrusion[] 46 ... provided on the inner periphery of the opening 45 of the upper plate 43,” which are “guided by the side surfaces 19a,” *i.e. the inclined plane*. Ex. 1008, ¶¶19, 21. This causes the filter element 30 to “rotate slightly in the twisting direction.” *Id.*, ¶21. The protrusion “fits into the depressions 21 formed between the two adjacent pleated portions 19.” *Id.*

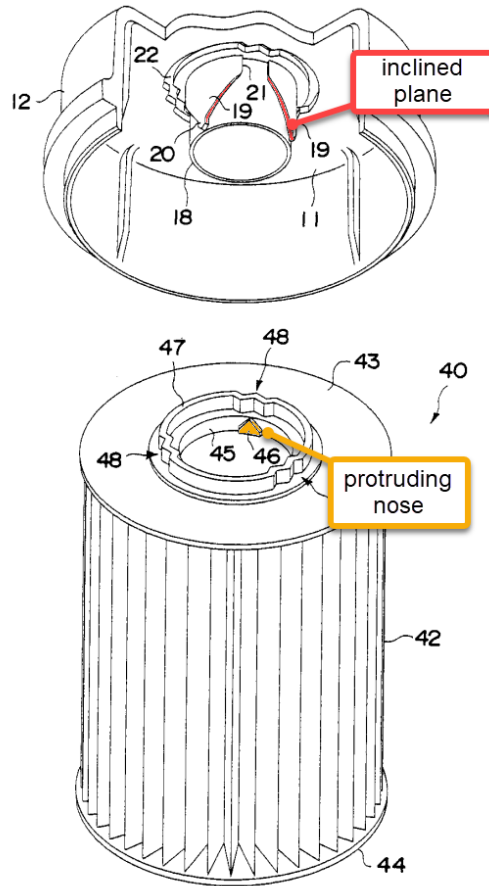
101. As I discussed above, it is my opinion that the first positioning means is not a means-plus-function term. However, to the extent Patent Owner argues that it is a means-plus-function term, the corresponding structure of a first positioning means when it is a protruding nose on a filter insert is 8:33-51, 8:63-67, 12:36-45, 14:12-20, 14:60-64, Figs. 8, 30, 35, and their equivalents. These descriptions describe the noses depicted in Figures 8, 30, and 35 below:



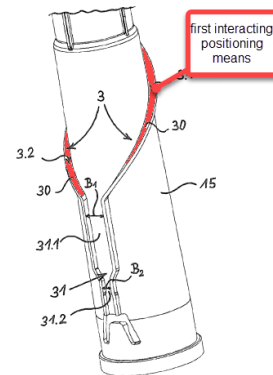
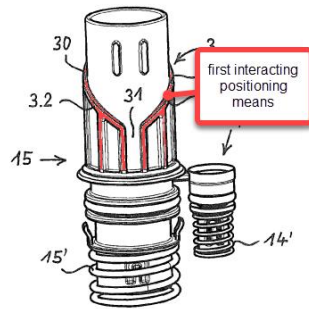
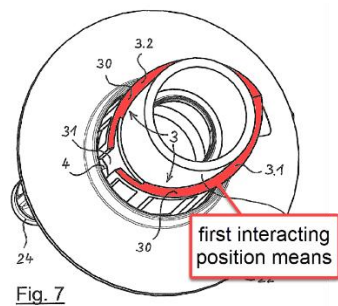
102. The descriptions describe a nose structure that is on the inner circumference of a filter insert, that slides on the surface of an inclined plane, that allows a filter insert to rotate, and that as it enters the axial guide 31, a blocking element enters a channel. As I just discussed, Yokoyama discloses such a structure.

103. With respect to a *“second positioning means on the filter housing ... being ... the inclined plane,”* Yokoyama discloses an *inclined plane on the filter housing*, specifically “pleated portions 19,” *i.e. inclined plane*, which are on “the outer circumferential portion of the pipe portion 18 provided in the upper case half 10,” *i.e. filter housing*. Ex. 1008, ¶21. The “locking protrusions 46” slide along these inclined

planes, causing the filter element 30 to “rotate slightly in the twisting direction.” *Id.*, ¶21.



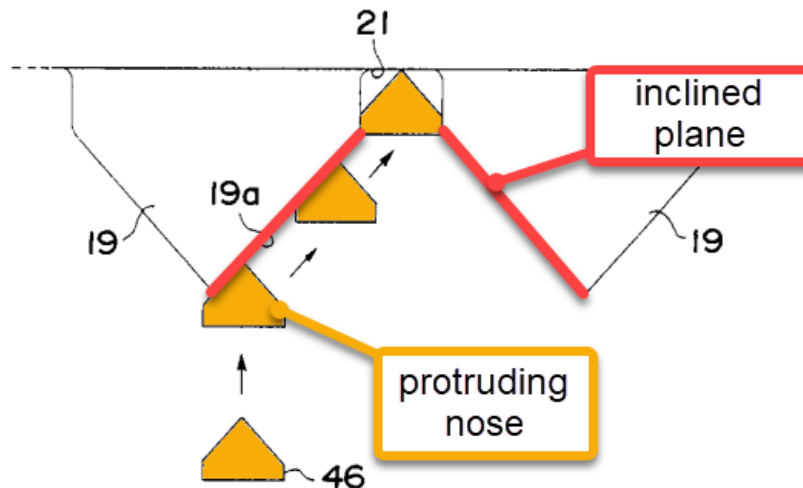
104. As I discussed above, it is my opinion that the second positioning means is not a means-plus-function term. However, to the extent Patent Owner argues that it is, the corresponding structure of a second positioning means that is an inclined plane on a filter housing is 8:27-51, 12:14-26, 14:34-51, Figs. 7, 29, 37, and their equivalents. These descriptions describe the inclined planes depicted in Figures 7, 29, and 37 below:



105. The descriptions describe an inclined plane structure that is on the outer circumference of a pipe nozzle, that forms a sliding surface for nose 4, that allows a filter insert to rotate, and that as the nose enters the axial guide 31, a blocking element enters a channel. As I just discussed, this structure is disclosed by Yokoyama.

106. With respect to the limitation *“first positioning means ... which interact with second positioning means ... when the ring filter insert is inserted into the filter housing,”* Yokoyama discloses that when the filter insert is inserted into the filter housing, the protrusion will interact with the inclined plane by sliding along it. Specifically, when the “filter element 30 [*i.e. ring filter insert*] is pushed upward [*i.e. inserted*] so that the pipe portion 18 (and the three pleated portions 19 [*i.e. inclined planes*]) of the upper case half 10 [*i.e. filter housing*] passes through the opening 45 of the ... filter element 40 from above,” “the three locking protrusions 46 [*i.e. protruding noses*] ... are guided by the side surfaces 19a of the three pleated portions

19 [*i.e. inclined planes*].” Ex. 1008, ¶21. Figure 6 depicts how the protruding nose slides along the inclined plane.



107. With respect to the limitation “*which are arranged to bring the blocking element into engagement with the eccentric opening,*” Yokoyama discloses that when the protruding nose slides along the inclined plane into position, this causes the sealing member (*i.e. blocking element*) to engage with grooves (*i.e. eccentric opening*.” Specifically, when “locking protrusions 46 [*i.e. protruding nose*]... is inserted into depressions 21 formed between the adjacent pleated portions 19 [*i.e. inclined plane*],” “a sealing member 47 [*i.e. blocking element*] ... fits into grooves 22 [*i.e. eccentric opening*].” Ex. 1008, ¶22. This allows the filter element 40 to be “fixed to the upper case half 10.” *Id.*

15[e]: the inclined plane and the nose arranged to be moved in relation to each other in such a way that they slide along each other and bring the

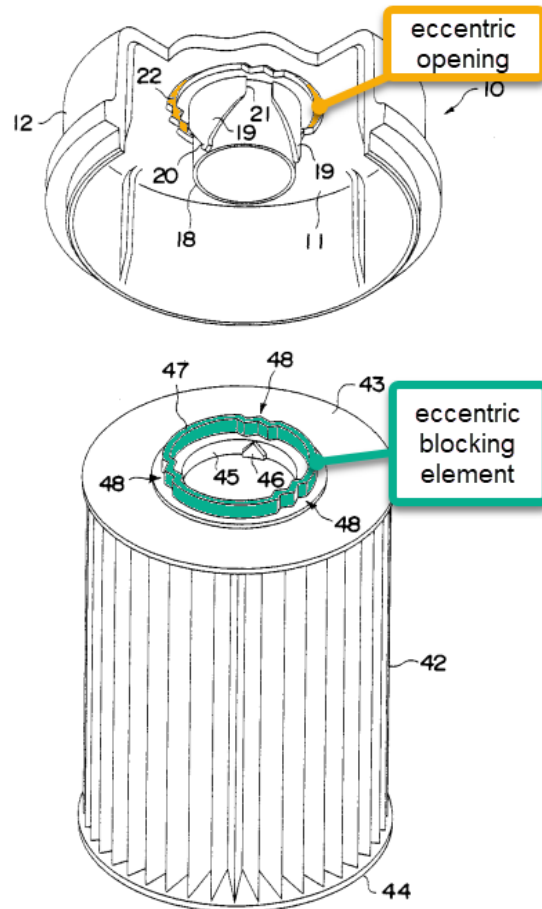
blocking element into engagement with the eccentric opening, by rotating the ring filter insert relative to the filter housing,

108. In my opinion, Yokoyama discloses this limitation.

109. With respect to ***“the inclined plane and the nose arranged to be moved in relation to each other in such a way that they slide along each other,”*** Yokoyama discloses that the “locking protrusions” ***slide along*** the “side surfaces 19a” until they “fit into depressions 21,” as shown by annotated Figure 6 below. Ex. 1008, ¶21; Fig. 1; Fig. 6. Thus, in my opinion, they are ***arranged to be moved in relation to each other in such a way that they slide along each other.***

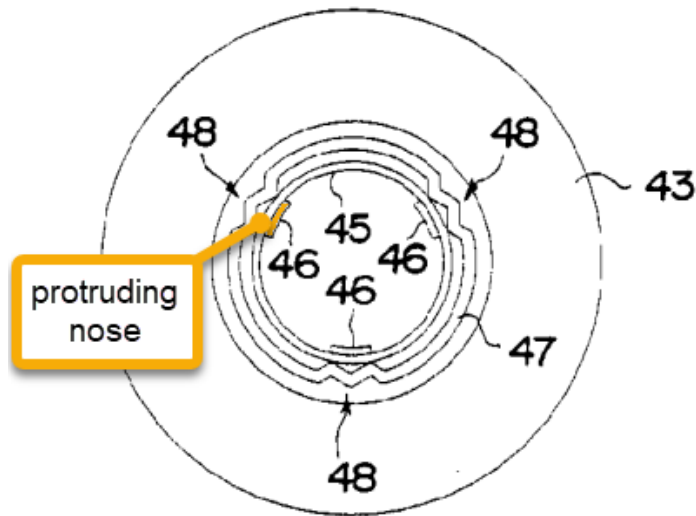
110. With respect to the limitation ***“bring the blocking element into engagement with the eccentric opening, by rotating the ring filter insert relative to the filter housing,”*** Yokoyama discloses that after the protrusion slides along the inclined plane and enters the depression 21, “sealing member 47 [*i.e. blocking element*]” engages with “grooves 22 [*i.e. eccentric opening*],” and that “the filter element 30 [*i.e. ring filter insert*] will rotate slightly in the twisting direction” relative to the filter housing. Ex. 1008, ¶21. In my opinion, a POSITA would understand that because of the positioning of the W-shaped portions of the sealing member and grooves, as well as the shape of the inclined plane, the rotation causes the filter insert to be oriented correctly so that the sealing member properly engages with the groove. The filter insert rotates as the nose glides along the inclined plane until the insert is

oriented properly so that the W-shaped portions of the sealing member aligns with the W-shaped portions of the groove.



15[f]: the first positioning means being one of embodied and arranged on an inner circumference of the ring filter insert.

111. In my opinion, Yokoyama discloses this limitation. For example, Yokoyama discloses that the locking protrusions [i.e. **first positioning means/protruding nose**] are in the “inner periphery of the opening,” i.e. **the inner circumference**, of the filter element (i.e. **ring filter insert**). Ex. 1008, ¶19; Fig. 4B.



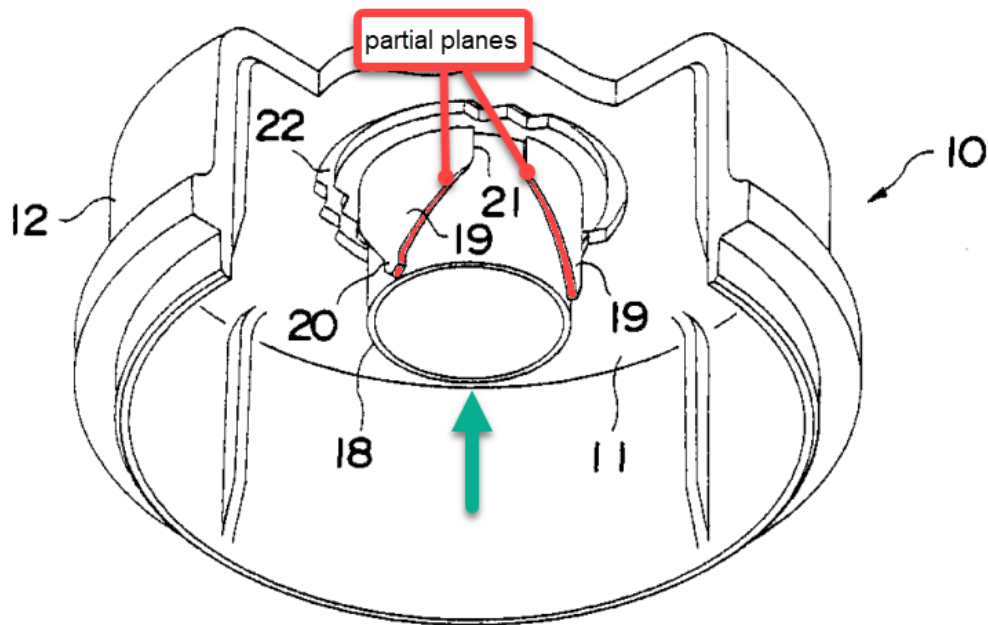
- B. Claim 16: The ring filter insert according to claim 15, wherein the inclined plane is formed by two partial planes which run towards each other in opposite directions and which in each case extend across half of an inner circumference of the ring filter insert.**

112. This claim requires that the inclined plane be part of the inner circumference of the ring filter insert, whereas claim 15 does allow the inclined plane to be part of the filter housing part instead. Under its plain meaning, Yokoyama does not disclose claim 16, since Yokoyama's inclined plane is part of the ring filter insert, as discussed above.

113. However, I understand that in the underlying litigation, Patent Owner has asserted infringement of this claim by a device which purportedly has an inclined plane on the filter housing, instead of the ring filter insert as required by Claim 16. Ex. 1012, 9. In my opinion, such an infringement read is not consistent with the plain meaning of the claims.

114. But, out of an abundance of caution, I provide my opinion under Patent Owner's reading of the claim. Yokoyama does disclose Patent Owner's reading of the claim.

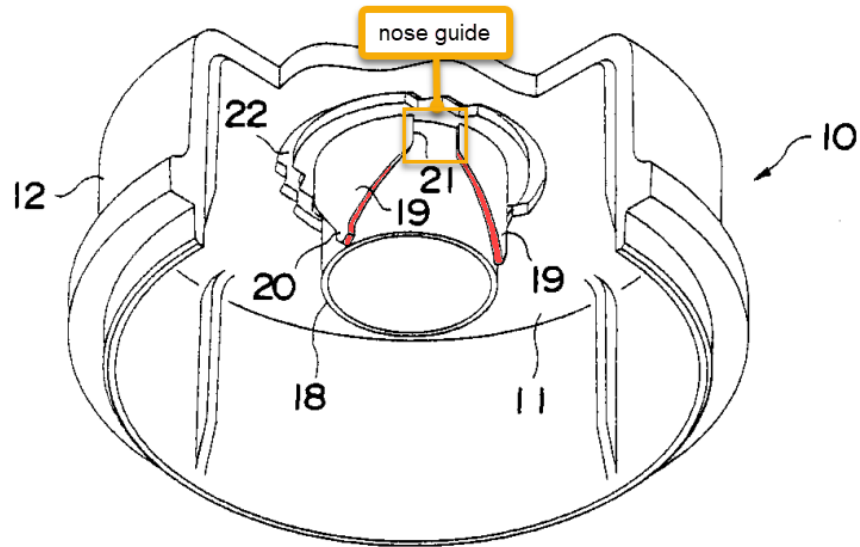
115. Yokoyama depicts that the inclined plane is ***formed by two partial planes which run towards each other in opposite directions***. Ex. 1008, Fig. 1, ¶31 (“left and right side surfaces 19a of ... the pleated portions 19 ... are formed in a tapered shape that narrows downward”). Yokoyama further teaches that there may be “one ... pleated portion[] 19,” instead of the three that is depicted in the figures. Ex. 1008, ¶33. In my opinion, A POSITA would understand from these disclosures that when there is only one pleated portion 19, its left and right side surfaces ***extend across half of the outer circumference of the filter housing portion*** in order to form a tapered shape. Thus, in the below Figure 1, if there was only one pleated portion 19, then the two planes would meet at the point on the opposite side as indicated with the green arrow.



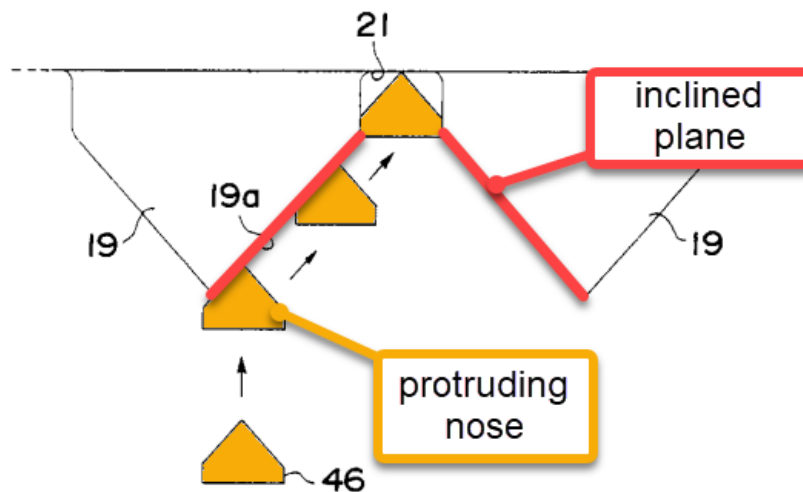
116. Indeed, it is my opinion that if there is only one pleated portion as Yokoyama discloses, then the surfaces must meet at a point on the opposite side thereby forming two inclined planes that extend across half of the outer circumference. This is because a POSITA would understand that if these side surfaces did not meet at a point, then the corresponding protrusion would not be able to slide along the side surfaces for some orientations of the filter insert.

C. Claim 17: The ring filter insert according to claim 15, including a guide for the nose which runs in an axial direction and is connected to a lower end of the inclined plane.

117. In my opinion, Yokoyama discloses this limitation. For example, Yokoyama discloses that the protrusion slides along the side surfaces and enters a “depression[] 21” which is a *nose guide*. Ex. 1008, ¶21.



118. The depression 21 runs in an ***axial direction*** because the protrusion enters it from an ***axial direction***, and as depicted in Figures 1 and 6, is ***connected to a lower end of the inclined plane***. Ex. 1008, Fig. 6.

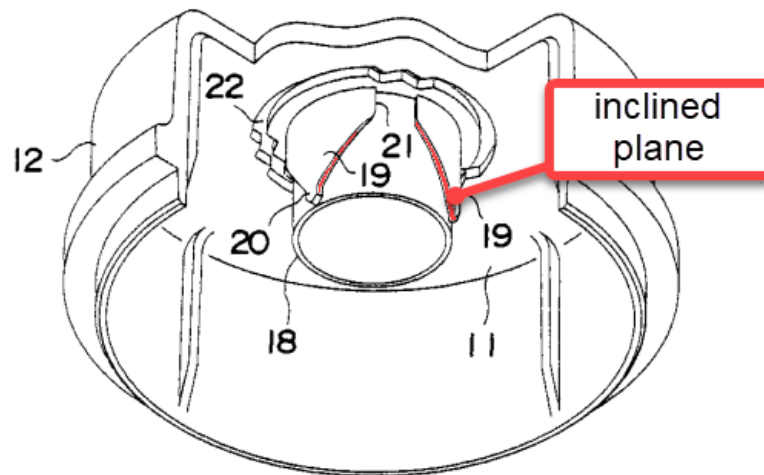


119. To the extent Patent Owner argues that the depression is connected to the upper end of the inclined plane, and not the lower end, as I explained above, such an argument is merely contingent on the orientation of the filter device and makes no

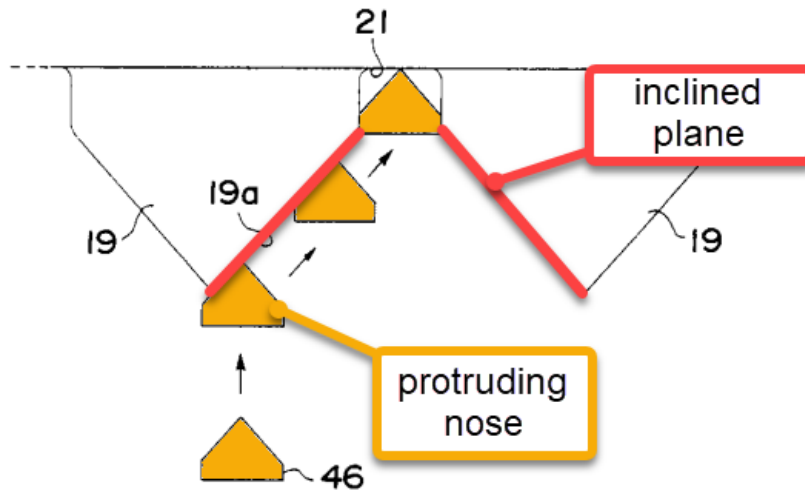
functional difference. In any case, the filter device would work properly if it was oriented upside-down, thereby making the depression connected to the lower end of the inclined plane.

D. Claim 19: The ring filter insert according to claim 15, wherein the inclined plane is formed by one of a radially protruding rib and step which forms a contact surface for the nose on one of an upper or lower side thereof.

120. In my opinion, Yokoyama discloses this limitation. As depicted in Figure 1, the inclined plane is a *radially protruding rib or step*, as it protrudes radially outward of the pipe portion 18. Ex. 1008, ¶21.

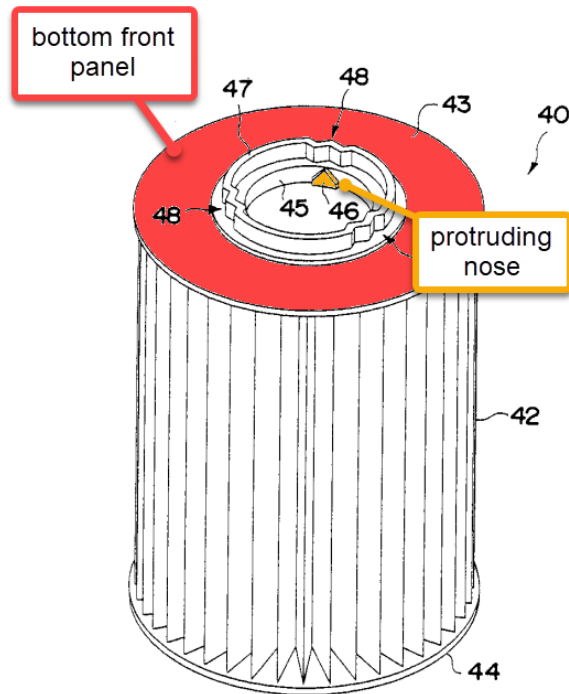


121. As shown in Figure 6, the inclined plane *forms a contact surface for the protruding nose* on the upper or lower side of the nose (depending on its orientation). Ex. 1008, ¶21 (“locking protrusions 46 ... are guided by the side surfaces ... and move upward”).



E. **Claim 23: The ring filter insert according to claim 15, wherein the nose is formed integrally with the bottom front panel of the ring filter insert.**

122. In my opinion, Yokoyama discloses this limitation. For example, Yokoyama discloses that the protrusions (*i.e.* ***protruding nose***) is formed integrally “on the inner periphery ... of the upper plate 43,” *i.e.* ***bottom front panel of the ring filter insert***. Ex. 1008, ¶19.



F. Claim 25: The ring filter insert according to claim 15, wherein the blocking element is an axially sealing valve element which is elastically arranged on the bottom front panel.

123. I begin by commenting on the term “axially sealing.” In the parallel litigation, Patent Owner has asserted in its infringement contentions that “axially sealing” refers to the “axial movement of the eccentric blocking element.” Ex. 1012, 15. I do not agree that that is consistent with the plain meaning of “axially sealing.”

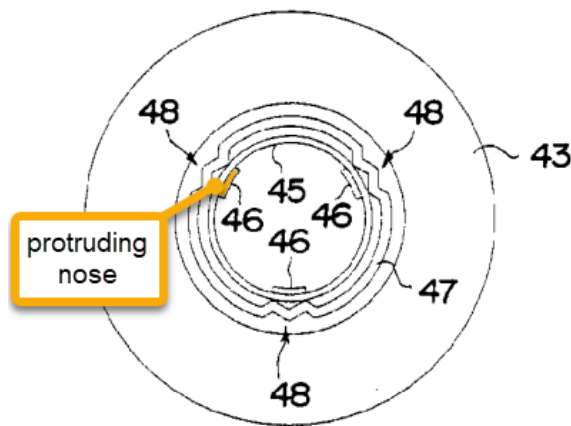
124. However, under Patent Owner’s apparent construction of the term, Yokoyama discloses that its “sealing member 47” moves in an axial direction into “grooves 22” to form a seal, and is therefore *axially sealing* under Patent Owner’s interpretation. Ex. 1008, ¶24 (“sealing member 47 ... is pressed upward within the grooves 22”).

125. Yokoyama also discloses that “sealing member 47” is a ***sealing valve element*** because it forms a seal between “upper case half 10” and “filter element 40.” Ex. 1008, ¶24. As a result, liquid from “inflow pipe IP” can be filtered and flow out through “outflow pipe OP.” *Id.*, ¶28. In other words, when the sealing member forms a seal, it allows liquid to flow through the filter, thereby acting as a ***valve element***.

126. Finally, Yokoyama discloses that sealing member 47 “is made of an elastic material such as rubber” and is therefore ***elastically arranged on the bottom front panel***.

G. Claim 30: The ring filter insert according to claim 15, wherein the protruding nose protrudes radially.

127. In my opinion, Yokoyama discloses this limitation. For example, Yokoyama discloses that the locking protrusions (i.e. ***protruding nose***) ***protrude radially***, that is, they “protrud[e] toward the center of the opening 45.” Ex. 1008, ¶19; Fig. 4B.



IX. GROUND 1: YOKOYAMA AND CLINE RENDER OBVIOUS CLAIMS 15-17, 19, 23-25, 28-30

128. As I discussed above, it is my opinion that Yokoyama discloses or renders obvious every limitation of independent claim 15, including the eccentric blocking element and eccentric opening. However, in the '203 patent, the eccentric blocking element and opening provide an outlet to drain the filter housing when the insert is removed. Yokoyama's eccentric blocking element and opening do not have such a function. To the extent Patent Owner argues that such a function is required by the claims (despite the plain language of the claims not requiring any such function), it is disclosed in Cline, and it would have been obvious to combine Yokoyama with Cline's eccentric blocking element and opening to provide a draining mechanism.

A. Motivation to Combine

129. In my opinion, a POSITA would have been motivated to combine Yokoyama's filter with Cline's eccentric drain valve. Cline teaches a filter insert that has an eccentric "flow blocker" which blocks an eccentric quick-drain outlet for draining the filter housing, as shown in Figure 5 below. *See also* Ex. 1009, ¶21.

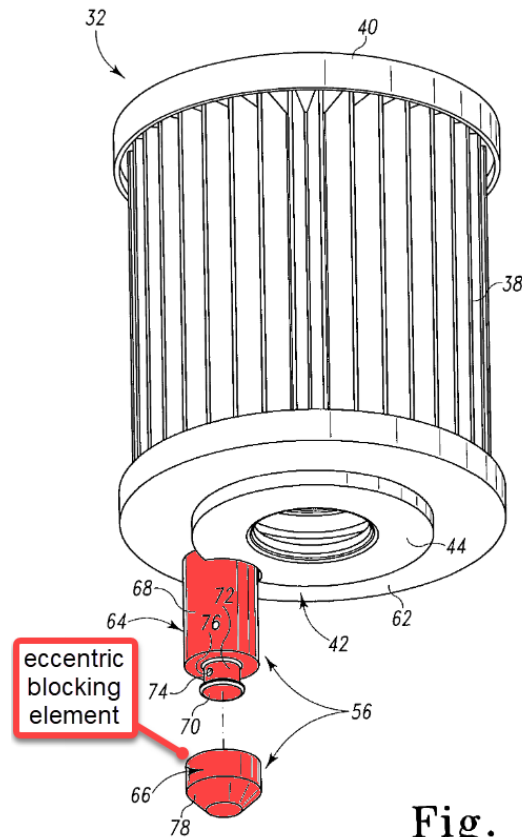


Fig. 5

130. Yokoyama does not describe such a draining mechanism. But a POSITA would have been motivated to use Cline’s eccentric draining mechanism because of its well-known benefits. For example, Brisson discloses that “[w]hen an operator wants to change the filtering element, it is desirable that he does not receive any oil splashes and that the oil does not flow onto the outer walls of the filter housing and onto the other engine components. It is also desirable that a minimum amount of oil be lost when changing the filter element.” Ex. 1005, ¶¶2-3. Brisson teaches that it was known such things could be accomplished by “draining the housing when changing the filter cartridge.” *Id.*, ¶9. In view of these well-known benefits, a POSITA would have looked to Cline’s draining mechanism.

131. A POSITA would have also been motivated to make this modification because of the known benefits from Cline's relatively simple design for draining. Cline's design uses a "flow blocker" which is "molded onto the post 64." Ex. 1009, ¶27. Because the flow blocker is removable and replaceable, it can be made of any size or shape to better fit the quick-drain outlet. Cline's simpler design allows for easy replacement of the blocking element.

132. In addition, Cline's eccentric drain valve had the well-known benefit of minimizing the amount of oil that is lost when changing the filter element. This would provide some environmental protection, as it would avoid the disposal of a large amount of material. Indeed, a POSITA would be motivated by Yokoyama itself, which states that the "filter element 40 is a consumable item" and is to be "replace[d]." Ex. 1008, ¶26. Thus, as well understood to a POSITA and as stated in Yokoyama, the upper and lower casings of these filters have to be disassembled (such as for example, by unscrewing the lower case half from the upper case half) to remove and replace the filter element. A POSITA would also understand that Yokoyama recognizes that these filter elements have to be replaced and serviced, and one of the goals of Yokoyama is ease of assembly (prevent wobble) and to prevent wear and/or damage of the seals during replacement (e.g. which can be caused by misalignment and/or friction during replacement, assembly and/or disassembly). A POSITA would understand that an eccentric drain valve would facilitate such desired improvements.

133. A POSITA would have understood that Cline's simpler design would be more reliable and less prone to damage compared to other designs. Repairs would also be easier using Cline's design due to the significant reduction in parts. Thus, given these known benefits, a POSITA would be motivated to use Cline's flow blocker and quick-drain outlet.

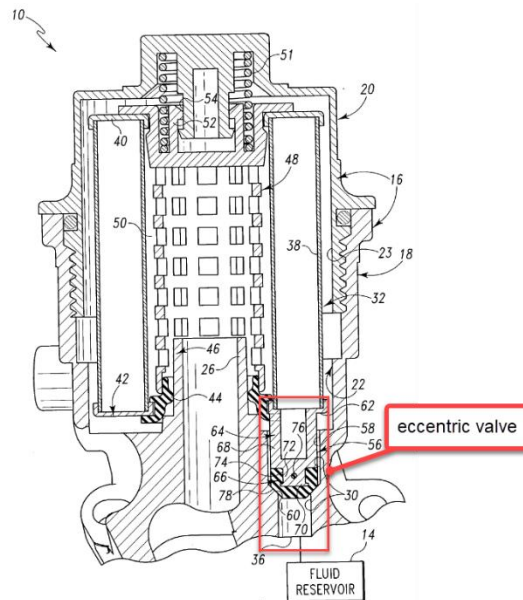
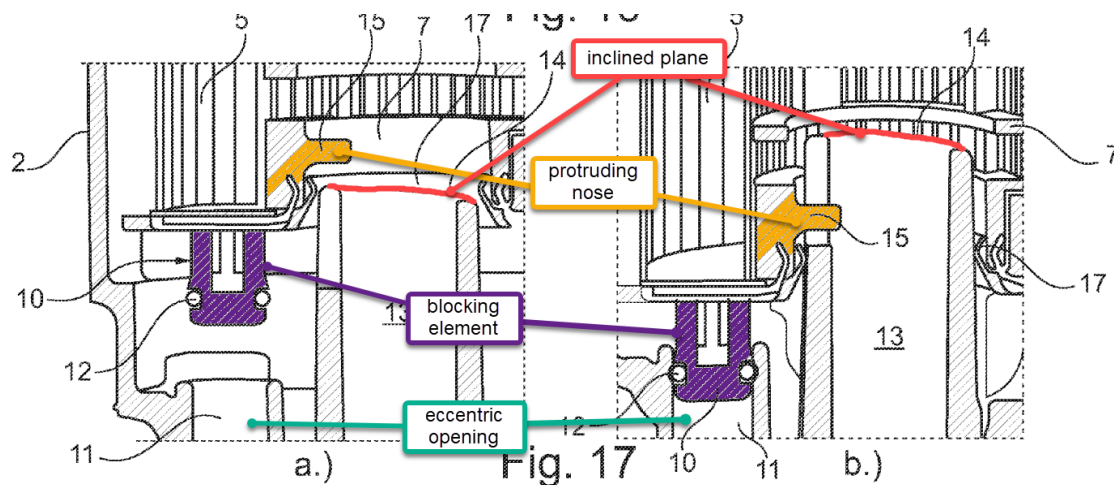


Fig. 6

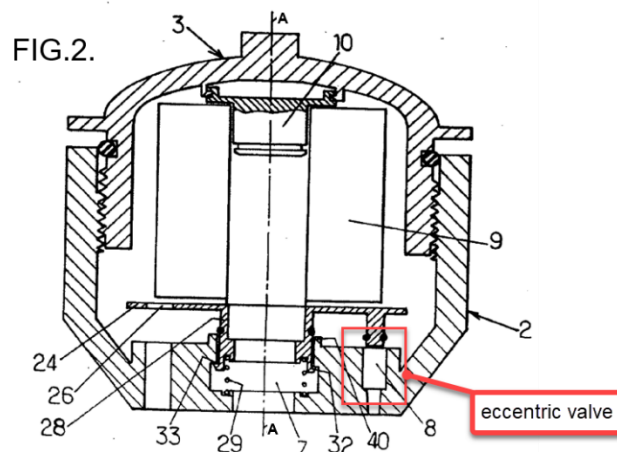
134. Another factor that would have motivated a POSITA to make this change was the fact that eccentric drain valves were very common and well-known in the art. Beyond Cline, an eccentric drain valve is also disclosed in Deschamps and Brisson. For example, Deschamps discloses a “pin 10” that “is aligned coaxially flush with the channel 11,” and that the pin engages with the channel to form a seal as a filter insert rotates in the filter housing via a “guide element 15” (*i.e. a protruding nose*)

“slid[ing] along guid contour 14” (i.e. *an inclined plane*).” Ex. 1010, ¶35. This mechanism is illustrated in the below annotated figure.



135. A POSITA, knowing that an eccentric drain mechanism works reliably with a nose/inclined plane guiding mechanism as shown in Deschamps, would have been motivated to provide a similar mechanism in Yokoyama.

136. Similarly, Brisson discloses a “protrusion 27 which extends axially from the plate 24 to close the drain channel 8,” the protrusion and the channel being eccentric as shown below. Ex. 1005, ¶50; Figs. 1, 2.



137. This modification would have also been obvious because it is the application of a known technique (eccentric drain valve) to a known device (Yokoyama's filter) ready for improvement (the addition of an eccentric drain plug and orifice/port to drain the liquid/fluid in the filter during for example, service, maintenance, and/or replacement) to yield predictable results. Yokoyama does not describe a drain valve, and so including Cline's valve design would obtain the predictable result of Yokoyama's filter using Cline's valve design.

138. A POSITA would have known that Cline's valve design could be placed in such a way as to be sealed and engaged when Yokoyama's filter insert is properly oriented, such as on the "upper plate 43" next to the "sealing member 47." Ex. 1008, ¶20. A POSITA would be motivated to use such a design (which as shown by Deschamps was a known design) because it would prevent the draining of fluid until the filter needs to be replaced. Yokoyama's filter could be re-oriented so that removal of the filter insert opens the valve and allows liquid to flow out for safe disposal via the pull of gravity.

139. In addition, a POSITA would have understood that having a drain plug / blocking element in an eccentric location is just a matter of simple design choice and just the substitution of one known element for another. This choice would depend on packaging space available as well as the surrounding area and operator/tool/hand access for assembly and disassembly for routine regular service and replacement of the

filter element. For example, a POSITA would have readily recognized that vehicle engine compartments contain multiple components, and packaging these components in the limited space available is constraining. A POSITA would also have readily understood and recognized the need for accessibility for service (for example, the need for a technician/mechanic to access by hand and tools the service plug and filter assembly for replacement and service, ideas known in the field as “Design for Service” and “Design for Assembly”). Thus it would have been a simple matter of design choice to a POSITA to have the drain plug / blocking element in an eccentric location depending on vehicle component packaging and accessibility for service.

140. A POSITA would have also reasonably expected the combination to succeed. Cline’s valve design is a typical valve design and modifying Yokoyama to use such a valve design would have been well within the capabilities of a POSITA. Moreover, a POSITA would have been aware of similar designs where an eccentric valve is engaged as a filter rotates into position within a filter housing, such as described in Deschamps. Such designs would have allowed a POSITA to expect the combination of Yokoyama and Cline to be successful.

141. Finally, Yokoyama, Cline and the ’203 patent are analogous art because all three are directed to the same field of endeavor: the field of liquid filter systems with a removable filter insert. Ex. 1001, Abstract (“A liquid filter including a filter housing, a ring filter insert and a cover.”); Ex. 1008, Abstract (“To provide a filter

device having a structure in which a filter element can be easily assembled into a filter case.”); Ex. 1009, Abstract (“A filter apparatus comprises a filter element to be positioned in an interior region defined by a housing.”).

B. Claim 15

142. Aside for the claim limitations I discuss below, Yokoyama in view of Cline renders obvious claims 15 for the same reasons I discussed above in Ground 1.

15[b]: an eccentric blocking element arranged on the bottom front panel for engaging an eccentric opening in the filter housing,

143. In my opinion, Yokoyama in view of Cline render obvious this limitation. In the Yokoyama-Cline combination, a “flow blocker 66” is an ***eccentric blocking element***, as shown in the annotated Figure 5 from Cline below.

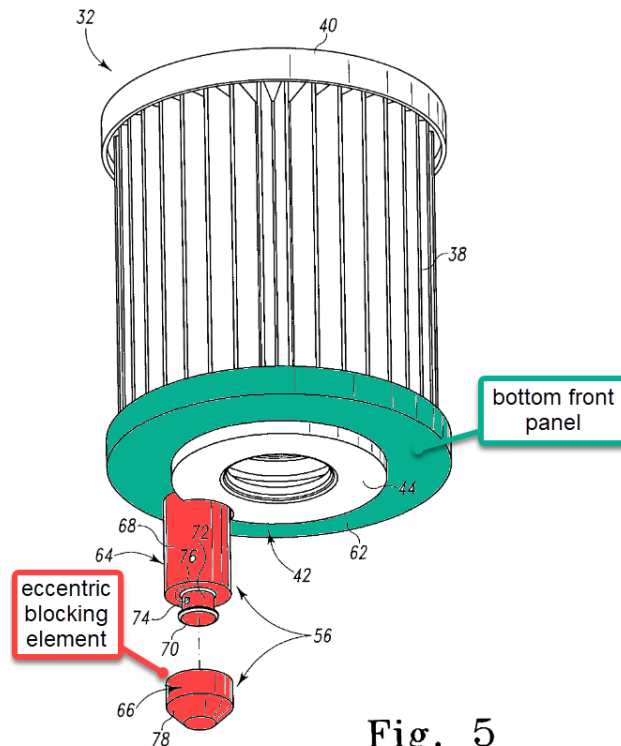


Fig. 5

144. Cline also discloses a “quick-drain outlet 36” (i.e. ***eccentric opening***) which is depicted in Figure 6 at the bottom of cover 20 (i.e. ***filter housing***). Ex. 1009, ¶¶20-21; Fig. 6. Cline discloses that the flow blocker “engages a valve seat 60 ... to block a flow of fluid from the interior region 22 through the quick-drain outlet 36,” thus the flow blocker is a block element ***for engaging the eccentric opening***. *Id.*, ¶25.

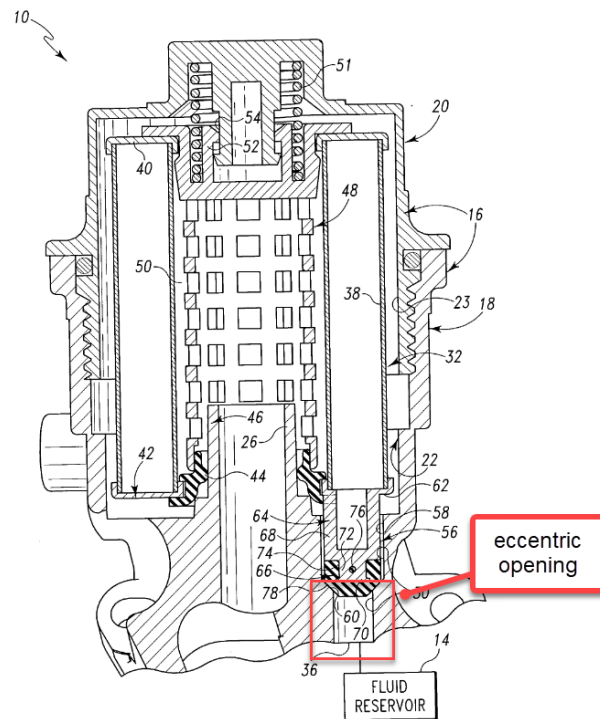


Fig. 6

145. Thus, the combination of the above disclosures in Cline with Yokoyama renders obvious this limitation.

15[c]: first positioning means on the ring filter insert, which interact with second positioning means on the filter housing when the ring filter insert is

inserted into the filter housing and which are arranged to bring the blocking element into engagement with the eccentric opening,

146. In my opinion, Yokoyama in view of Cline renders obvious this limitation.

147. As I discussed above for claim 1, Yokoyama discloses “***first positioning means on the ring filter insert, which interact with second positioning means on the filter housing when the ring filter insert is inserted into the filter housing,***” and specifically protrusions that slide along side walls of a pleated portion.

148. In the Yokoyama-Cline combination, when the protrusions have slid along the pleated portion and entered depressions 21, Cline’s flow blocker “engages a valve seat 60 ... to block a flow of fluid from the interior region 22 through the quick-drain outlet 36,” and thus the positioning means are ***arranged to bring the blocking element into engagement with the eccentric opening.*** Ex. 1009, ¶25.

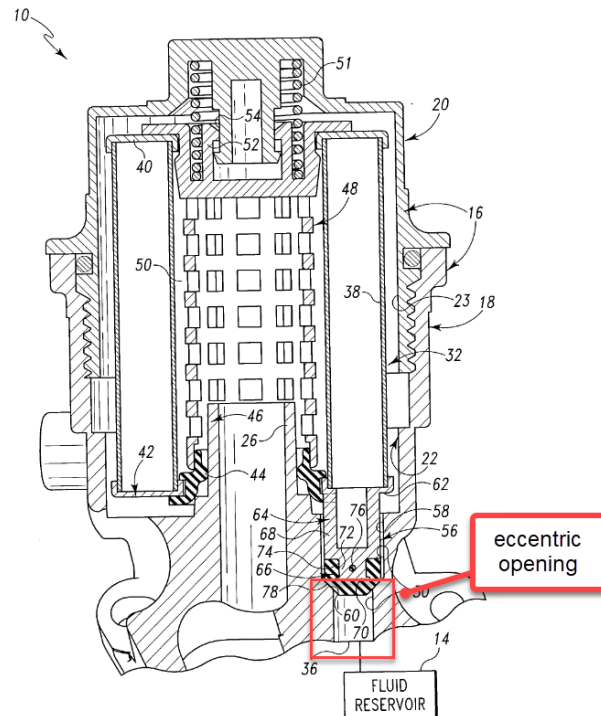


Fig. 6

15[e]: the inclined plane and the nose arranged to be moved in relation to each other in such a way that they slide along each other and bring the blocking element into engagement with the eccentric opening

149. In my opinion, Yokoyama in view of Cline render obvious this limitation.

150. As I discussed above for limitation 15[d], when Yokoyama's protrusion slides along the inclined plane and enters depressions 21, Cline's flow blocker "engages a valve seat 60 ... to block a flow of fluid from the interior region 22 through the quick-drain outlet 36," thereby **bringing the blocking element into engagement with the eccentric opening**. Ex. 1009, ¶25.

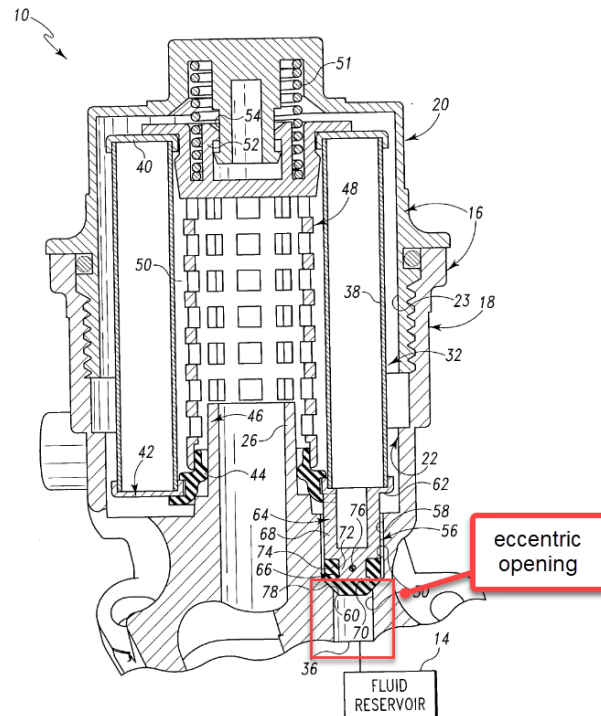
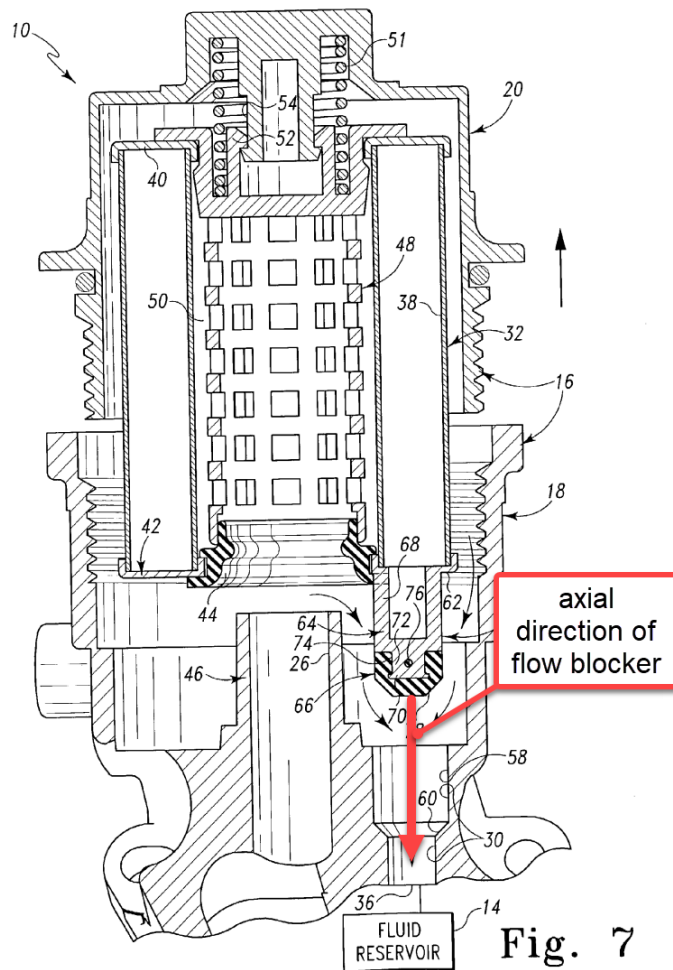


Fig. 6

C. **Claim 24: The ring filter insert according to claim 15, wherein the blocking element is one of a radially sealing valve element, an axially sealing valve element, and a radially sealing plug which is one of rigidly connected to the lower front panel and rigidly arranged on the lower front panel.**

151. As I discussed above, Patent Owner's apparent construction of "axially sealing" means a sealing element that moves in an axial direction. See Ex. 1012, 15. Under this construction, Cline discloses that valve element "flow blocker 66" (**blocking element**) moves in an axial direction, as shown below in annotated Figure 7, and is therefore *an axially sealing valve element*.



152. It is also my opinion that Cline discloses a **radially sealing plug** (which the Yokoyama-Cline combination uses) because when “flow blocker 66” seals the valve seat 60, the direction of the sealing pressure is in a radial direction, as depicted in Figure 6 below. Specifically, Cline discloses that “flow blocker 66 comprises a surface 78 ... for engaging the valve seat 60” and that “surface 78 and the valve seat 60 are ... frusto-conical in shape.” Ex. 1009, ¶29.

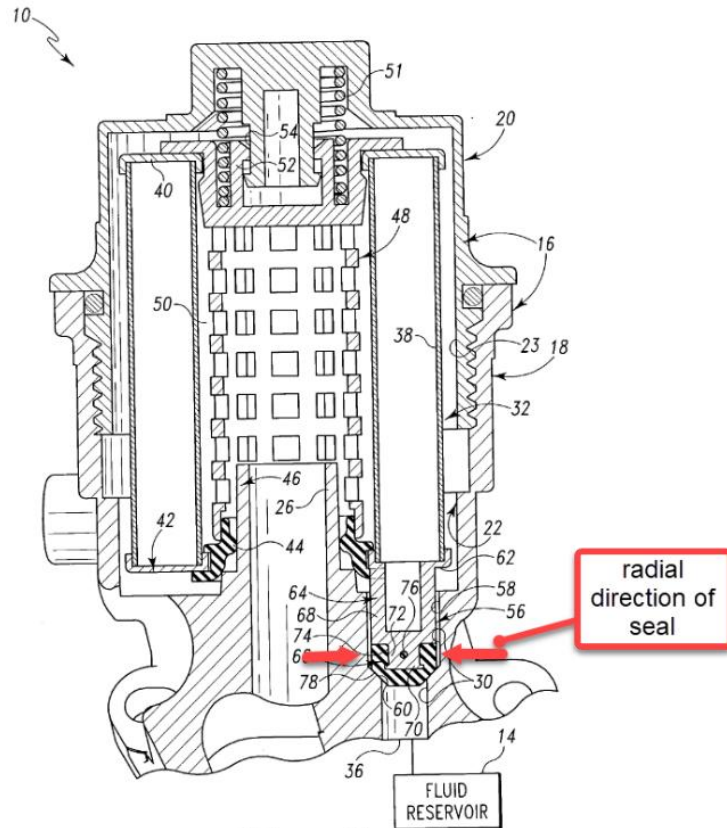


Fig. 6

153. In my opinion, Cline further discloses that the flow blocker is ***rigidly arranged on the bottom panel*** because it is “secured to the post 64” which is “made of a plastic material” and is “monolithic with” the “end cap 42” of the filter element 32. Ex. 1009, ¶27; Fig. 5.

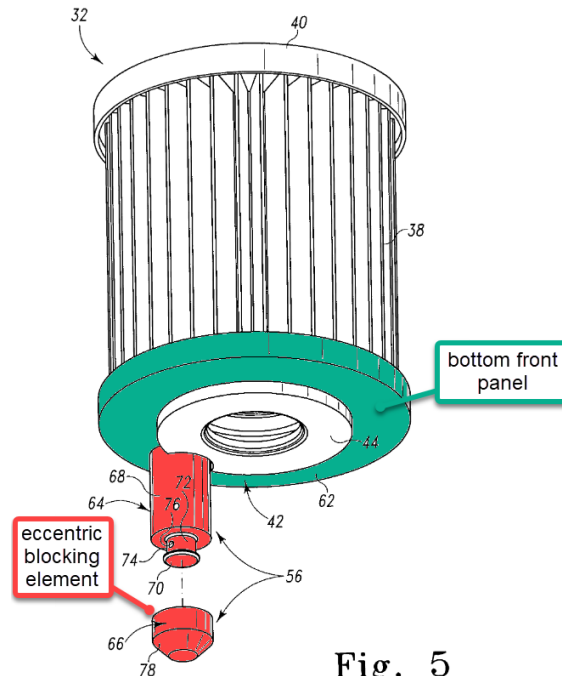


Fig. 5

154. As I explained above, the Yokoyama-Cline combination uses the Cline blocking element and drain, and thus renders obvious this claim.

D. Claim 25: The ring filter insert according to claim 15, wherein the blocking element is an axially sealing valve element which is elastically arranged on the bottom front panel.

155. In my opinion, Yokoyama in view of Cline render obvious this claim. As discussed above for Claim 24, under Patent Owner’s apparent construction, Cline discloses an *axially sealing valve element*. Cline further discloses that the flow blocker is *elastically arranged on the bottom front panel* because it is “made of an elastomeric material and molded onto the post.” Ex. 1009, ¶27. The post is “made of a plastic material” and is “monolithic with” the “end cap 42” of the filter element 32, and thus is part of the bottom front panel. Ex. 1009, ¶27.

156. It is also my opinion that Cline discloses an *axially sealing valve element* because the direction of sealing pressure is in an *axial direction*.

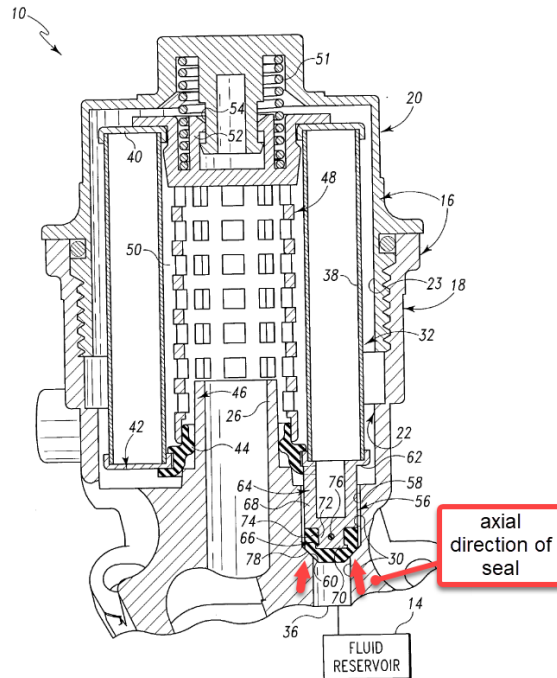


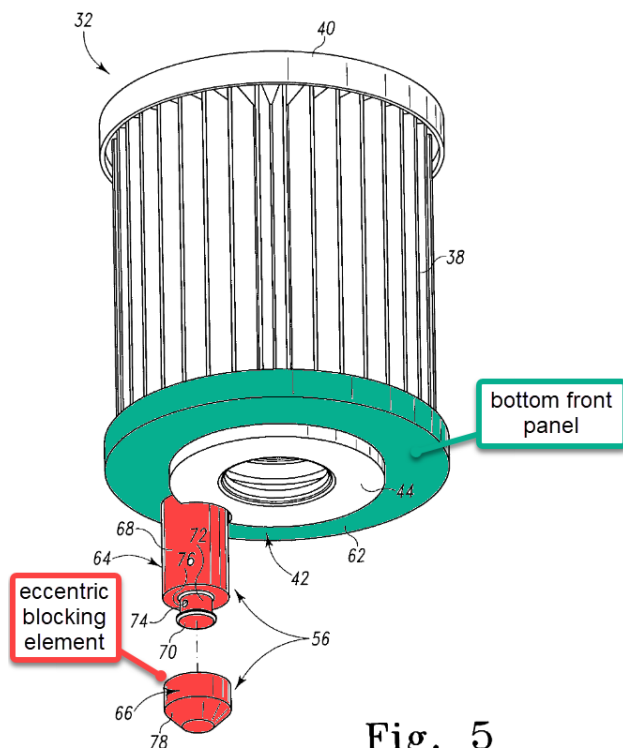
Fig. 6

157. Thus, the Yokoyama-Cline combination uses the Cline blocking element and drain and thus renders this claim obvious.

E. Claim 28: The ring filter insert according to claim 15, wherein the blocking element is formed from two parts, the two parts of the blocking element being engaged with each other in a manner allowing a compensation of radial dimension tolerances and angle errors.

158. In my opinion, Yokoyama in view of Cline render obvious this limitation. For example, Cline discloses that its *blocking element* is *formed from two parts*: a “flow blocker 66” which is secured to a “post 64.” Ex. 1009, ¶25. Because the “flow blocker 66” is “made of an elastomeric material and molded onto the post

64,” a POSITA would understand that the flexibility of the elastomeric material *compensates for slight differences in the radial dimension and angle error of the blocking element*. The Yokoyama-Cline combination has this blocking element.



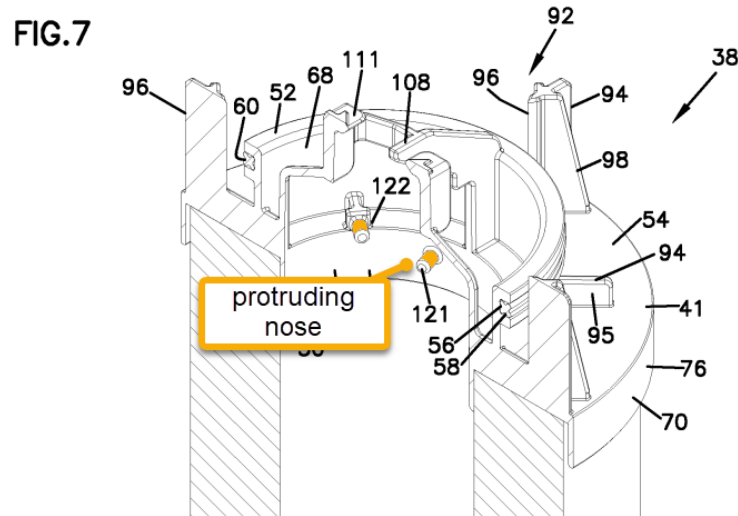
F. Claims 16, 17, 19, 23, 30

159. In my opinion, the Yokoyama-Cline combination renders obvious these claims for the same reasons discussed above in Ground 1.

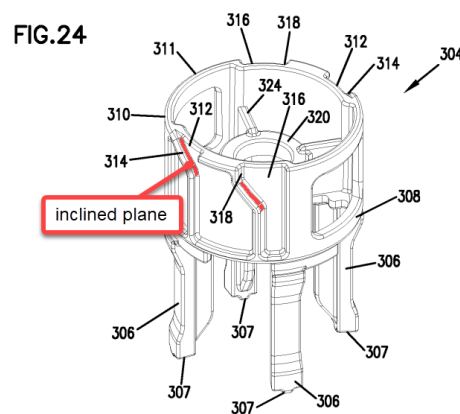
X. GROUND 3: HONERMANN AND CLINE RENDER OBVIOUS CLAIMS 1, 2-3, 5, 8-11, 15-17, 19, 23-25, 28-30

160. I again provide a brief summary of Honermann. Like Yokoyama, Honermann also discloses a replaceable filter cartridge that is inserted into a filter housing. In order to guide the cartridge to the proper orientation within the filter

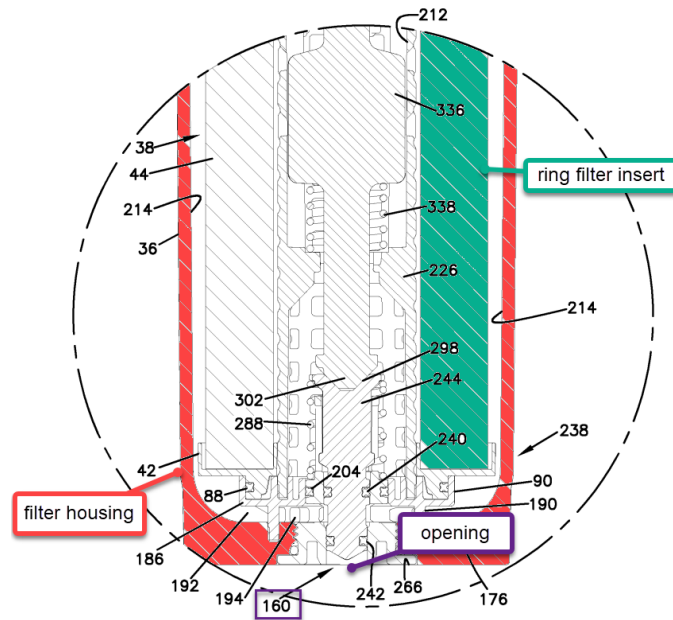
housing, Honermann also provides a protruding nose and inclined plane guide mechanism. Specifically, within the inner circumference of the filter cartridge are several protruding noses, as shown below:



161. These protruding noses slide along inclined planes on the outer circumference of a basket which is part of the filter housing. Below is a figure of the basket with inclined planes:



162. When the cartridge is properly oriented and inserted into the filter housing, a “drain-valve assembly” at the bottom of the filter is sealed, as shown in the below figure:



163. While Honermann alone discloses or renders obvious most limitations, it does not expressly disclose an eccentric blocking element or eccentric opening. Honermann does disclose a blocking element and opening, but does not expressly disclose that they are eccentric. However, it would have been obvious to combine Honermann with Cline’s blocking element and opening.

A. Motivation to Combine

164. In my opinion, a POSITA would have been motivated to combine Honermann’s filter with Cline’s eccentric drain valve. Cline teaches a filter insert that has an eccentric “flow blocker” which blocks an eccentric quick-drain outlet for

draining the filter housing, as shown in Figure 5 below. *See also* Ex. 1009, ¶21. While Honermann also discloses a plug and opening (though not eccentric), Honermann's plug and opening is a complicated valve system, and a POSITA would have found it obvious to modify Honermann to use Cline's simpler eccentric plug and opening instead.

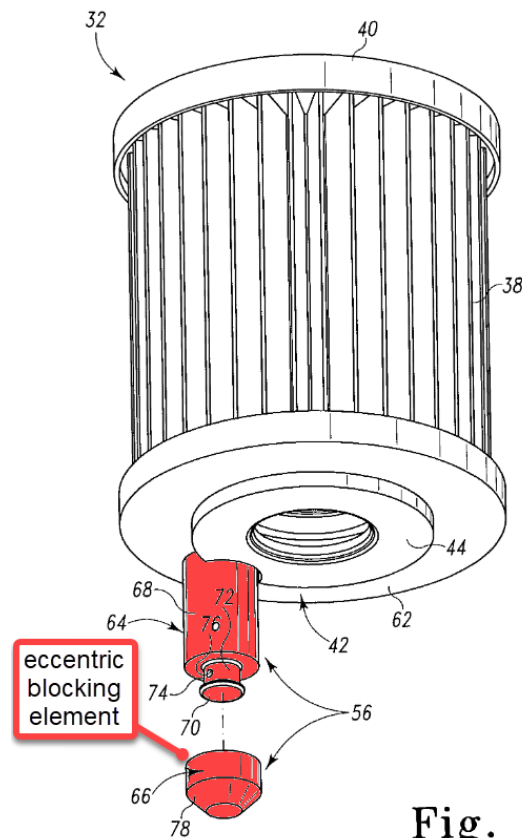


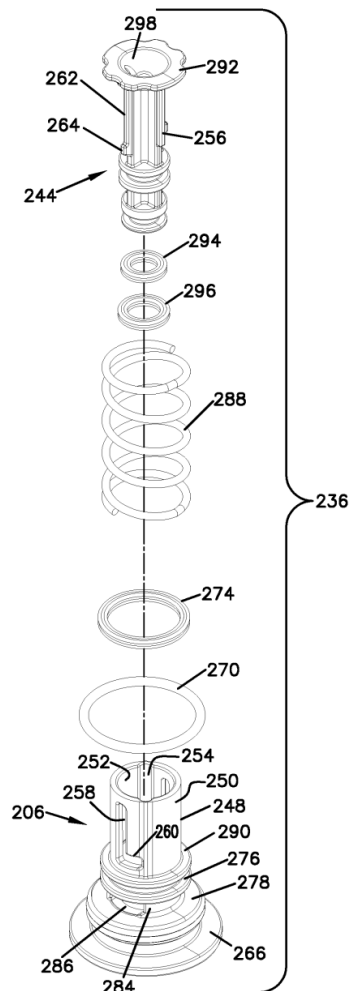
Fig. 5

165. A POSITA would have been motivated to make this modification because of the known benefits from Cline's simpler design. Cline's design uses a "flow blocker" which is "molded onto the post 64." Ex. 1009, ¶27. Because the flow blocker is removable and replaceable, it can be made of any size or shape to better fit the quick-

drain outlet. Cline’s simpler design allows for easy replacement of the blocking element.

166. By contrast, Honermann’s plug 244 is a complicated design which requires the use of a “valve spring to move the plug into the sealed position.” Ex. 1006, ¶188. Indeed, as shown in Figure 13, Honermann’s design uses numerous parts in a complicated fashion to create an entire drain valve assembly. Ex. 1006, ¶¶124-127.

FIG.13



167. A POSITA would have understood that Cline’s much simpler design would be more reliable and less prone to damage. Repairs would also be easier using

Cline's design due to the significant reduction in parts. Thus, given these known benefits, a POSITA would be motivated to use Cline's flow blocker and quick-drain outlet.

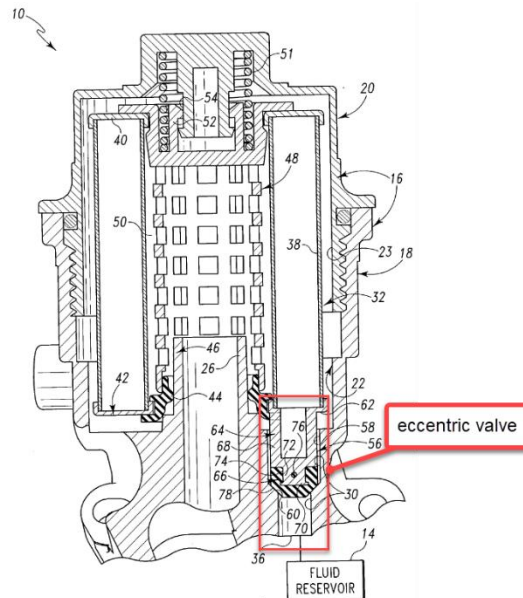
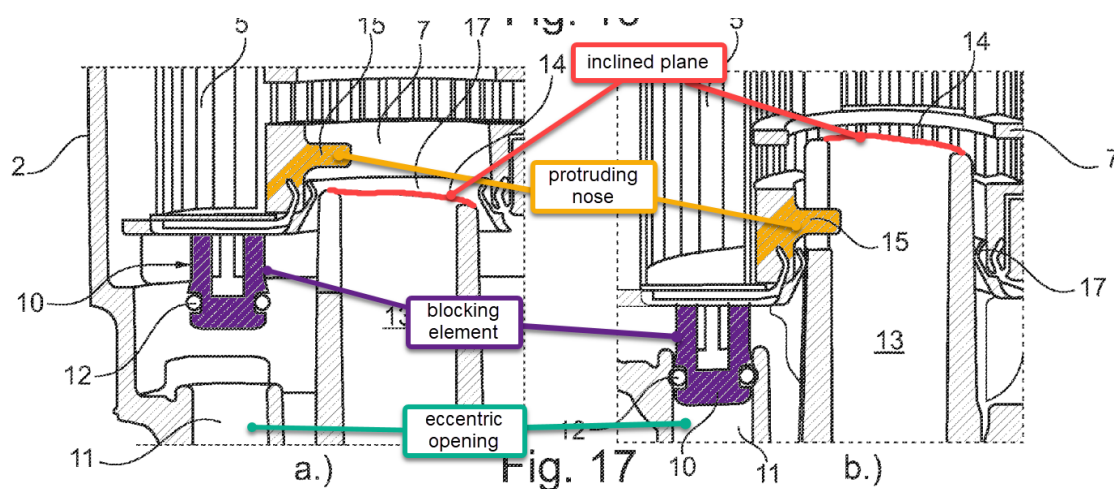


Fig. 6

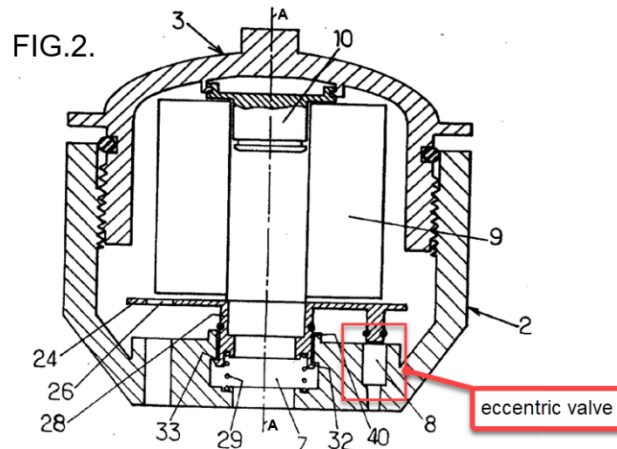
168. A POSITA would have also been motivated because Cline's flow blocker has the same function as Honermann's plug, which is to seal a valve for draining liquid when the filter insert is properly inserted, and of course to release the valve when the filter insert is removed. See Ex. 1010, ¶45; Ex. 1009, ¶34 ("The flow blocker 184 is secured to the flow blocker carrier 182 and comprises a frusto-conical surface 178 to engage the valve seat 60 when the filter element 132 is positioned in the interior region 22 and to disengage the valve seat 60 when the filter element 132 is removed from the interior region 22."). Given these similarities, a POSITA seeking to simplify Honermann's valve would therefore look to Cline's design.

169. Another factor that would have motivated a POSITA to make this change was the fact that eccentric drain valves were very common and well-known in the art. Beyond Cline, an eccentric drain valve is also disclosed in Deschamps and Brisson. For example, Deschamps discloses a “pin 10” that “is aligned coaxially flush with the channel 11,” and that the pin engages with the channel to form a seal as a filter insert rotates in the filter housing via a “guide element 15” (i.e. **a protruding nose**) “slid[ing] along guid contour 14” (i.e. **an inclined plane**).” Ex. 1010, ¶35. This mechanism is illustrated in the below annotated figure.



170. Deschamps also discloses that its blocking element and eccentric opening are engaged as a protruding nose slides along an inclined plane, as shown above. This is precisely what is claimed in the '203 patent and a POSITA would have been motivated by such disclosures to incorporate Cline's similar eccentric blocking element/opening with Honermann's similar inclined plane and nose guiding mechanism.

171. Similarly, Brisson discloses a “protrusion 27 which extends axially from the plate 24 to close the drain channel 8,” the protrusion and the channel being eccentric as shown below. Ex. 1005, ¶50; Figs. 1, 2.



172. This modification would have also been obvious because it is the simple substitution of one known element for another to obtain predictable results. Again, both Honermann’s plug and Cline’s flow blocker serve the same purpose of blocking flow when the filter insert is engaged, and draining the filter housing when the filter insert is removed. Thus, the substitution would obtain the predictable result of Honermann’s filter using Cline’s valve design. Honermann also teaches that its “drain-valve assembly 236 can be implemented independently of other features in the example embodiment,” indicating that Honermann’s filter system does not require the specific drain-valve assembly disclosed in Honermann and that other valve designs, such as the simpler design in Cline, would work just as well. Ex. 1006, ¶124.

173. In addition, a POSITA would have understood that having a drain plug / blocking element in an eccentric location is just a matter of simple design choice and just the substitution of one known element for another. This choice would depend on packaging space available as well as the surrounding area and operator/tool/hand access for assembly and disassembly for routine regular service and replacement of the filter element. For example, a POSITA would have readily recognized that vehicle engine compartments contain multiple components, and packaging these components in the limited space available is constraining. A POSITA would also have readily understood and recognized the need for accessibility for service (for example, the need for a technician/mechanic to access by hand and tools the service plug and filter assembly for replacement and service, ideas known in the field as “Design for Service” and “Design for Assembly”). Thus it would have been a simple matter of design choice to a POSITA to have the drain plug / blocking element in an eccentric location depending on vehicle component packaging and accessibility for service.

174. A POSITA would have also reasonably expected the combination to succeed. Again, Honermann teaches that its drain-valve assembly is “independent[]” of other components and therefore can be replaced with another system. Given the discussed similarities between Honermann and Cline, a POSITA would expect the combination to successfully result in Honermann’s filter system using Cline’s flow blocker and outlet.

175. Finally, Honermann, Cline and the '203 patent are analogous art because all three are directed to the same field of endeavor: the field of liquid filter systems with a removable filter insert. Ex. 1001, Abstract (“A liquid filter including a filter housing, a ring filter insert and a cover.”); Ex. 1006, Abstract (“The filter cartridge is mountable in a filter bowl 36 ...”), ¶2 (“In particular, this disclosure relates to filter assemblies and methods for use in liquid filtration, such as lube filters, hydraulic filters, and fuel filters.”); Ex. 1009, Abstract (“A filter apparatus comprises a filter element to be positioned in an interior region defined by a housing.”).

B. Claim 1

1[pre]: A liquid filter, comprising:

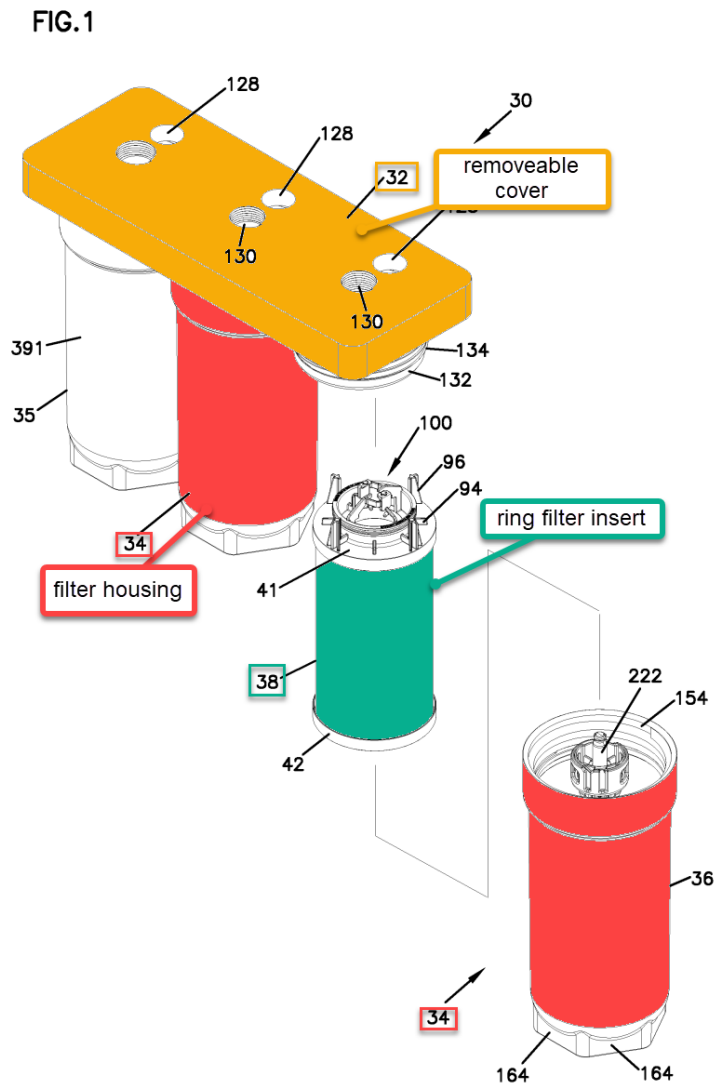
176. In my opinion, Honermann discloses this limitation. For example, Honermann discloses a “[l]iquid filter assembly,” “for use in liquid filtration, such as lube filters, hydraulic filters, and fuel filters.” Ex. 1006, Title, ¶2. In Figure 1, Honermann discloses “filter assemblies 34,” which are “full-flow filters.” *Id.*, ¶77. Figure 3 depicts a filter assembly 34.

1[a]: a filter housing,

177. In my opinion, Honermann discloses this limitation. For example, Honermann discloses that the filter assembly 34 includes “filter bowl 36 [*i.e.* ***filter housing***].” Ex. 1006, ¶78; Figs. 3, 8. Honermann also discloses an “inner assembly 364” that is also part of the filter housing. *Id.*, ¶110.

1[c]: a removeable cover arranged to close the filter housing during operation,

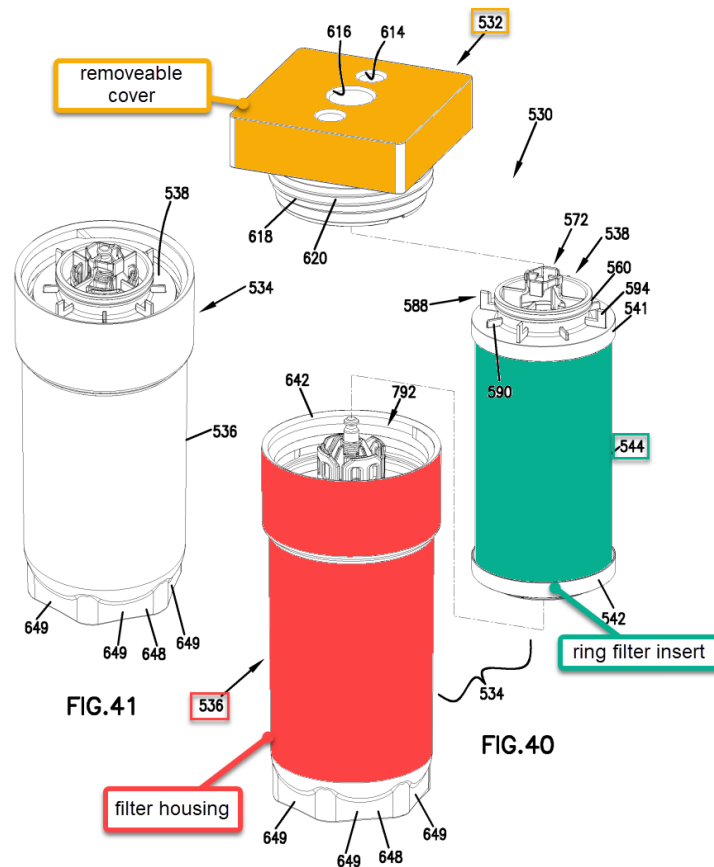
179. In my opinion, Honermann discloses this limitation. For example, Honermann discloses a “filter head 32” (i.e. **removeable cover**) to which one or more filter assemblies are attached. Ex. 1006, ¶¶77, 106; Fig. 1.



180. The filter head has threads 134 to which the filter bowl 36 (i.e. **filter housing**) is attached, causing the filter bowl to be closed, as depicted in Figure 1. The filter head provides an “inlet conduit 128” through which “liquid to be filtered flows

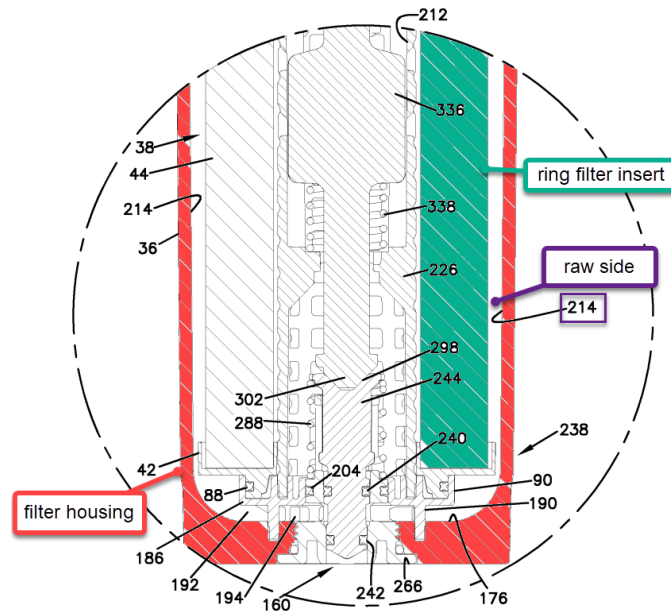
into the filter head 32,” and the filter head is “connected with other equipment, including a lubrication system of an engine,” which a POSITA would understand means that the filter bowl 36 is attached to the filter head 32 (and thus the filter bowl is closed) during operation of the filter. Ex. 1006, ¶106.

181. Honermann also describes another embodiment using a “filter head 532” that is attached to a single filter assembly 534, which operates similar to the first embodiment. Ex. 1006, ¶197; Figs. 40-41.

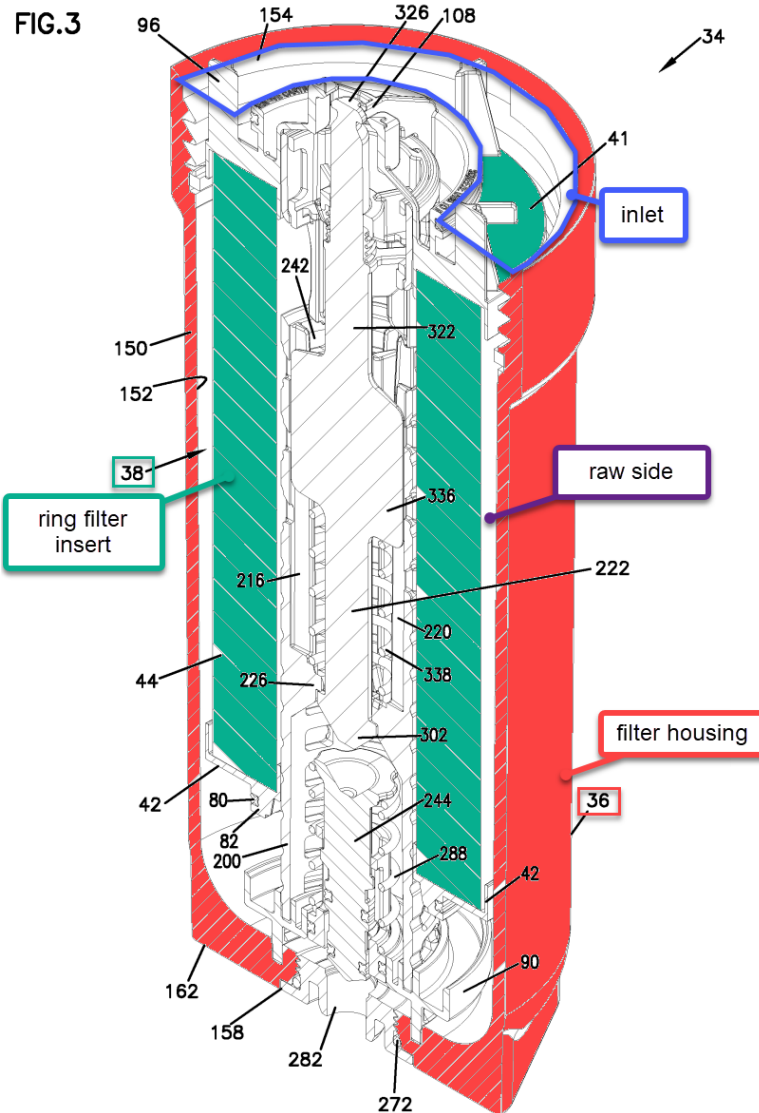


182. Although the filter head provides an inlet conduit and outlet conduit to the filter bowl, a POSITA would understand that the plain meaning of “close the filter

184. Specifically, Honermann discloses that “filter head 32 ... has an inlet conduit 128” and that “**liquid to be filtered** flows into the filter head 32 through the inlet conduit 128.” Ex. 1006, ¶106, Fig. 1; *see also* ¶215 (describing inlet conduit 614). Honermann also explains that the unfiltered liquid flows from the inlet conduit to “the unfiltered liquid volume” within the filter bowl (*i.e. raw side of the filter housing*), and “then flows through the filter media” to be filtered. Ex. 1006, ¶282; Figs. 12 (unfiltered liquid volume 214), 50 (unfiltered liquid volume 598).

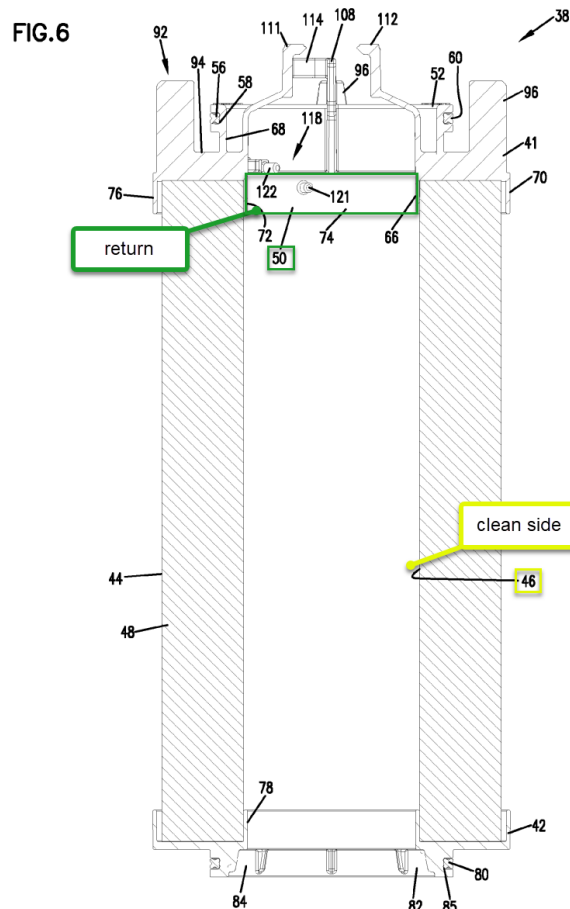


185. Although the inlet conduit is on the filter head (*i.e. removeable cover*) and not the filter bowl (*i.e. filter housing*), a POSITA would understand that unfiltered liquid flowing from the inlet conduit to the unfiltered liquid volume would pass through the inlet at the top of the filter housing, as shown in the annotated Figure 3 below.



1[e]: a return extending from a clean side of the filter housing for filtered clean liquid,

186. In my opinion, Honermann discloses this limitation. For example, as shown in the Figure 6 which I have annotated below, Honermann discloses ***a return extending from a clean side of the filter housing for filtered clean liquid.***

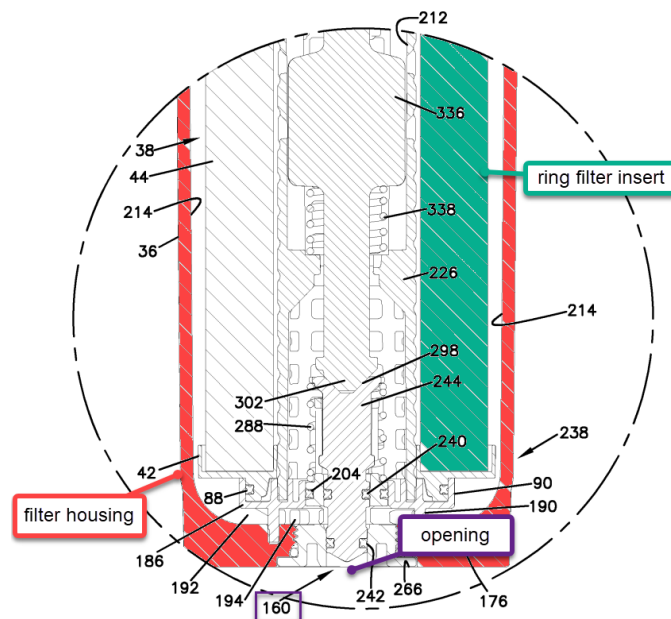


187. Specifically, Honermann discloses that after the unfiltered liquid flows through the filter media, it then flows “into the filtered liquid volume” (*i.e. **clean side***) then “through the first open aperture” (*i.e. **return***) then “through the open aperture ... of the adaptor and then through the outlet conduit ... of the filter head.” Ex. 1006, ¶282; *see also* ¶86 (“[F]luid to be filtered flows through the media 44, which functions to remove particulate or other debris from the fluid before flowing into the open filter [interior] 46.”); Fig. 6 (depicting open filter interior 46 and first open aperture 50); Fig. 50 (depicting filtered liquid volume 674 and first open aperture 550).

1[f]: an eccentric opening arranged in a bottom of a filter housing,

188. In my opinion, Honermann in view of Cline renders obvious this limitation.

189. Honermann discloses a “fluid outlet port 282” that is part of a “drainage aperture arrangement 160” (*i.e. opening*) that is at the bottom of the filter bowl (*i.e. filter housing*). Ex. 1006, ¶126; Fig. 12. When the drainage aperture arrangement is not plugged, liquid will flow from “the interior volume 152 of the bowl 36 through the drainage aperture arrangement 160.” *Id.* Thus, in my opinion, it is an opening.



190. Honermann does not expressly disclose that the opening is eccentric. However, eccentric drain openings were well-known in the art. For example, Cline discloses *an eccentric opening arranged in a bottom of a filter housing*. Cline

discloses a “quick-drain outlet 36” which is depicted in Figure 6 at the bottom of cover 20 (i.e. **filter housing**). Ex. 1009, ¶¶20-21; Fig. 6.

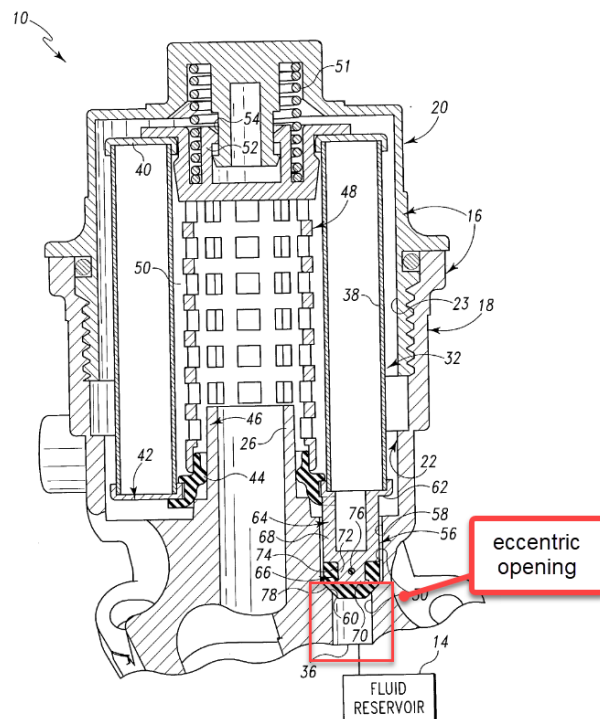


Fig. 6

191. As discussed above, it would have been obvious to modify Honermann’s opening to be eccentric in accordance with Cline’s teachings.

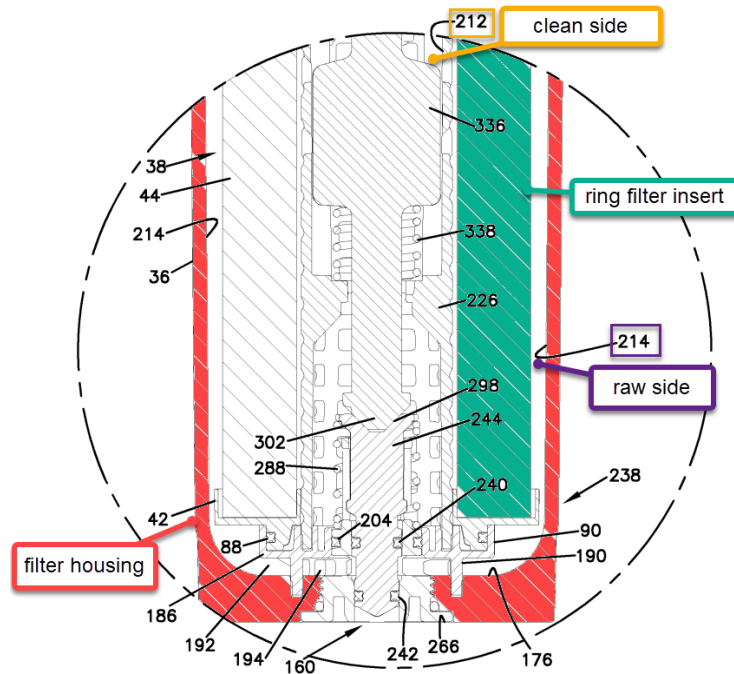
1[g]: the ring filter insert comprising a hollow-cylindrical filter material body, surrounded on the front sides by top and bottom from panels, the ring filter insert separating the raw side of the filter housing and the clean side of the filter housing from each another,

192. In my opinion, Honermann discloses this limitation.

193. With respect to the limitation “**the ring filter insert comprising a hollow-cylindrical filter material body,**” Honermann discloses that the filter cartridge (i.e. **ring filter insert**) includes “a **tubular** construction of filter media 44,” which “is

cylindrical in construction and defines an open filter interior 46,” i.e. is ***hollow***. Ex. 1006, ¶85. The filter media “functions to remove particulate or other debris.” *Id.*, ¶86. This media can be “pleated media” and includes “cellulose, synthetic, and blends of synthetic and cellulose.” *Id.*, ¶85.

194. With respect to the limitation “***the ring filter insert ... surrounded on front sides by top and bottom front panels,***” Honermann discloses that the filter cartridge (i.e. ***ring filter insert***) includes “first and second opposite endcaps 41, 42,” and that the media extends “between the first and second endcaps,” such as shown in Figure 6. Thus, the filter material body is ***surrounded on front sides by top and bottom front panels.***



1[h]: an eccentric blocking element for the eccentric opening arranged on the bottom front panel,

196. In my opinion, Honermann in view of Cline renders obvious this limitation.

197. Honermann discloses a “plug 244,” *i.e.* **blocking element**, that “is movably oriented between the sealed position 238 ... and a drainage position 246.” Ex. 1006, ¶126; Figs. 10, 12. As depicted in Figure 12, in the sealed position, the plug “block[s] fluid flow between the interior volume 152 of the bowl 36 and the drainage aperture arrangement 160,” *i.e.* **eccentric opening**.

198. Honermann does not expressly disclose that the plug is eccentric or that it is arranged on the bottom front panel. However, eccentric plugs arranged on the bottom of a filter insert were well-known in the art. For example, Cline discloses an

eccentric blocking element for the eccentric opening arranged on the bottom front panel.

199. Specifically, Cline discloses a “flow blocker 66” which is secured to a “post 64” that is arranged on the bottom front panel of filter element 32. Ex. 1009, ¶25; Fig. 5. Cline discloses that the flow blocker “engages a valve seat 60 ... to block a flow of fluid from the interior region 22 through the quick-drain outlet 36,” thus the flow blocker is a block element *for the eccentric opening*. *Id.*, ¶25.

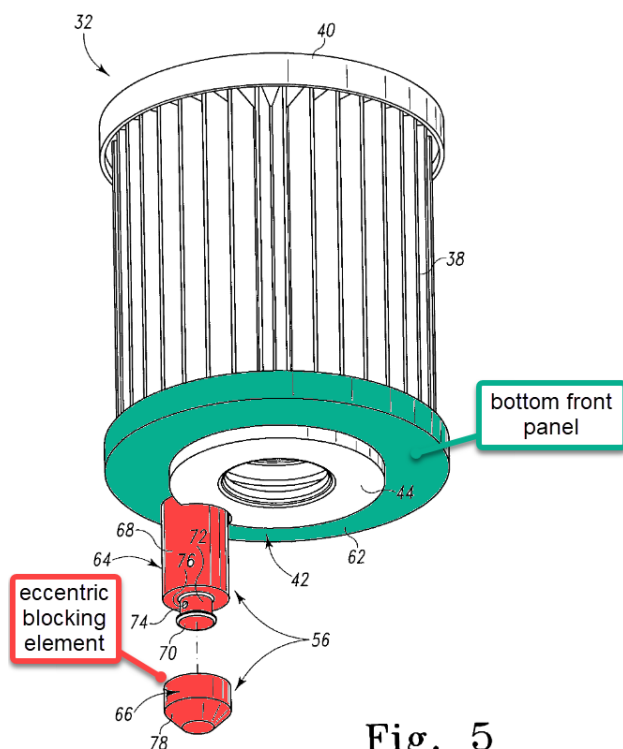


Fig. 5

200. As I discussed above, it would have been obvious to a POSITA to modify Honermann to use an eccentric blocking element at the bottom of the filter insert in accordance with Cline.

1[i]: first and second interacting positioning means each on one of the ring filter insert and the filter housing and arranged to bring the blocking element into engagement with the eccentric opening when the ring filter insert is inserted into the filter housing,

1[j]: the first positioning means comprising an inclined plane,

1[k]: the second positioning means comprising a protruding nose which is arranged opposite the inclined plane, and

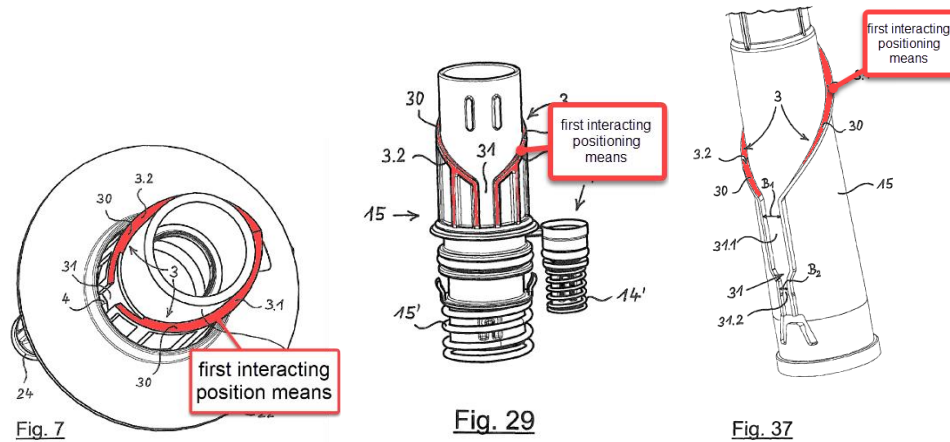
201. In my opinion, Honermann in view of Cline discloses these limitations.

202. I group these limitations together because 1[j] and 1[k] specify that the first and second positioning means are an inclined plane and protruding nose, respectively.

203. Honermann discloses that the first positioning means (inclined plane) is on the filter housing and the second positioning means (protruding nose) is on the ring filter insert.

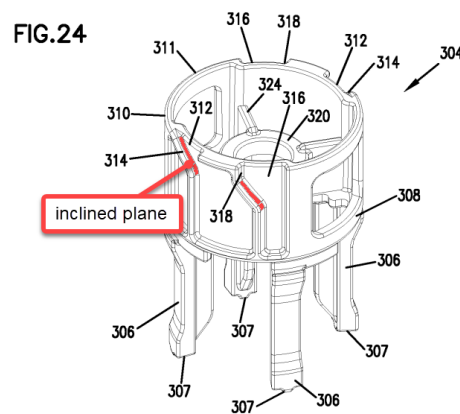
204. With respect to the limitation ***“first ... interacting positioning means ... on ... the filter housing [and] comprising an inclined plane,”*** as I discussed above, it is my opinion that the first interacting position means is not a means-plus-function term. However, to the extent Patent Owner argues that it is, the corresponding structure of a first interacting position means comprising an inclined plane on a filter housing is 8:27-51, 12:14-26, 14:34-51, Figs. 7, 29, 37, and their equivalents. These citations describe and depict an inclined plane structure that is on the outer circumference of a

pipe nozzle, that forms a sliding surface for nose 4, that allows a filter insert to rotate, and that as the nose enters the axial guide 31, a blocking element enters a channel.

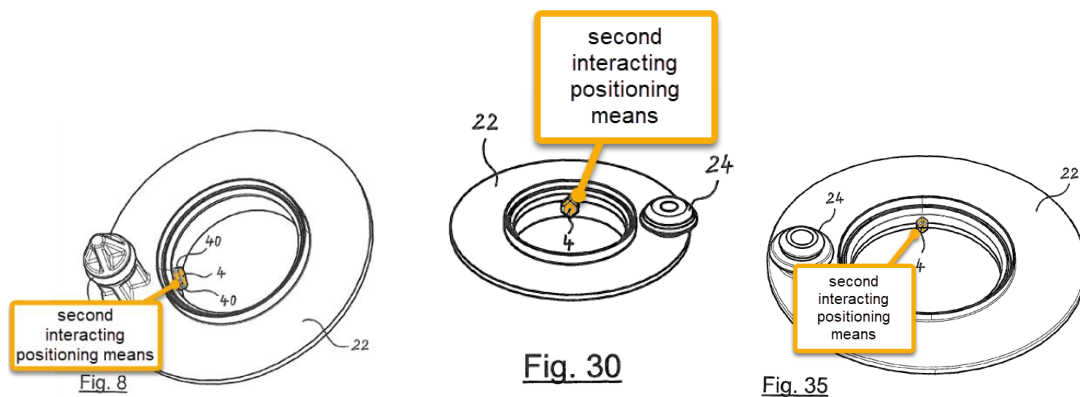


205. As discussed below, this structure is disclosed by Honermann.

206. Honermann discloses a “basket 304,” i.e. **first interacting positioning means**. Ex. 1006, ¶138. The basket 304 is part of the filter housing as depicted in Figure 8. The basket 304 has a “grooved wall 310” which has “a first groove 312 with a first slide surface 314,” i.e. **an inclined plane**. *Id.*, ¶141. The grooved wall has other slide surfaces as well.



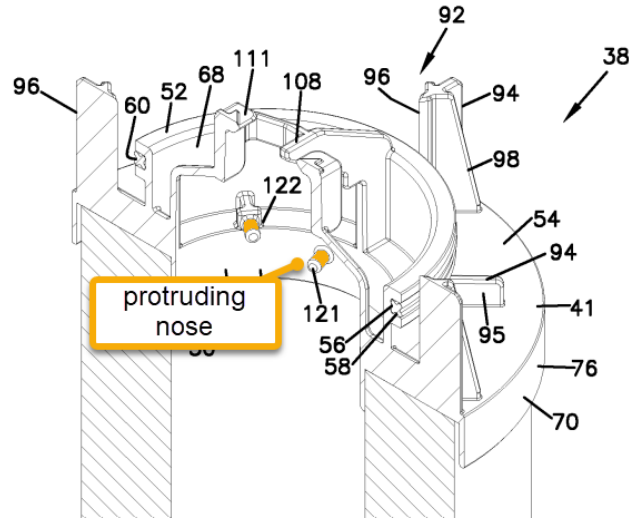
207. With respect to the limitation “*second interacting positioning means ... on ... the ring filter insert [and] comprising a protruding nose which is arranged opposite the inclined plane,*” as I discussed above, it is my opinion that the second interacting position means is not a means-plus-function term. However, to the extent Patent Owner argues that it is, the corresponding structure of a second interacting position means comprising an inclined plane on a filter housing is 8:33-51, 8:63-67, 12:36-45, 14:12-20, 14:60-64, Figs. 8, 30, 35, and their equivalents. The descriptions describe and depict a nose structure that is on the inner circumference of a filter insert, that slides on the surface of an inclined plane, that allows a filter insert to rotate, and that as it enters the axial guide 31, a blocking element enters a channel.



208. As discussed below, this structure is disclosed by Honermann.

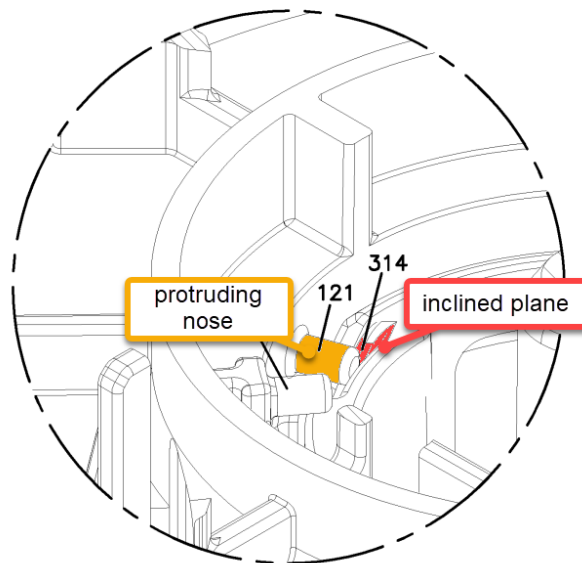
209. Honermann discloses that “filter cartridge 38 [i.e. *ring filter insert*] ... includes a protrusion arrangement 118 [i.e. *second interacting positioning means*],” which includes “first and second protrusions 121, 122 [i.e. *protruding nose*] extending from the aperture wall 66” of the filter cartridge. Ex. 1006, ¶98.

FIG.7



210. These protrusions engage with the slide surfaces, and thus are ***arranged opposite the inclined plane***. Ex. 1006, ¶143. Figure 30 depicts this arrangement.

FIG.30



211. With respect to the limitation ***“arranged to bring the blocking element into engagement with the eccentric opening when the ring filter insert is inserted into the filter housing,”*** Honermann teaches that the protrusions and slide surfaces

operate as a “lock-out mechanism” that “ensures that the filter system 30 cannot be operated unless the filter cartridge 38 [*i.e. ring filter insert*] has been operably assembled within the filter bowl 36 [*i.e. filter housing*].” Ex. 1006, ¶¶174, 178. Thus, “[w]hen the filter cartridge 38 is properly and operably positioned in the filter bowl 36, the first protrusion 121 comes in contact or engages the ramped first slide surface 314 of the basket 304.” *Id.*, ¶178.

212. Honermann also teaches that when “the filter cartridge 38 is operably positioned in the filter bowl 36 ... the drain-valve assembly 236 is in a sealed position 238,” where “plug 244 [*i.e. blocking element*] block[s] fluid flow between the interior volume 152 of the bowl 36 and the drainage aperture arrangement 160 [*i.e. eccentric opening*].” Ex. 1006, ¶¶124, 126. In other words, the protrusion and slide surfaces are arranged to properly position the filter cartridge into the filter bowl (*i.e. when the ring filter insert is inserted into the filter housing*), which also results in *bringing the blocking element into engagement with the eccentric opening*.

213. Moreover, in the Honermann-Cline combination, the blocking element enters the eccentric opening when the filter cartridge has been properly rotated and inserted into the filter bowl.

1[l]: the inclined plane and the nose arranged to be movable in relation to each other in such a way that they slide along each other and bring the

blocking element into engagement with the eccentric opening, by rotating the ring filter insert relative to the filter housing,

214. In my opinion, Honermann in view of Cline render obvious this limitation. For example, Honermann discloses that “[a]s the first protrusion 121 [*i.e. nose*] engages this first slide surface 314 [*i.e. inclined plane*], it causes the basket 304 to **rotate**.” Ex. 1006, ¶178. This rotation puts the basket in a “second locked position,” which allows the “second protrusion 122 [to] engage the second slide surface 318,” which further causes the basket to rotate to an unlocked position. *Id.*, ¶179. Because the basket is part of the filter housing, the ring filter insert has rotated ***relative to the filter housing***.

215. Once the basket is in the unlocked position, this allows “additional movement of the filter cartridge 38 in a downwardly axial direction toward the closed end 156.” Ex. 1006, ¶180. And, as discussed above, this puts the drain-valve assembly 236 in a sealed position 238,” where “plug 244 [*i.e. blocking element*] block[s] fluid flow between the interior volume 152 of the bowl 36 and the drainage aperture arrangement 160 [*i.e. eccentric opening*].” Ex. 1006, ¶¶124, 126. In the Honermann-Cline combination, the proper insertion of the filter cartridge results in Cline’s blocking element entering its eccentric opening.

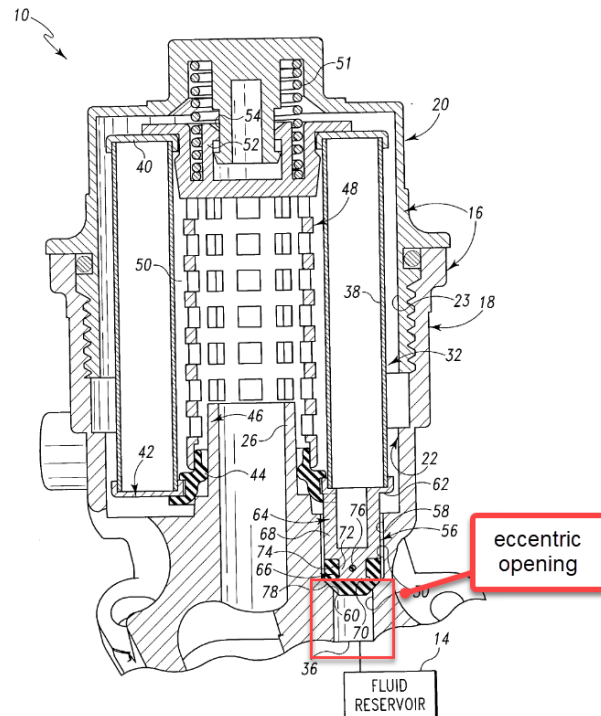


Fig. 6

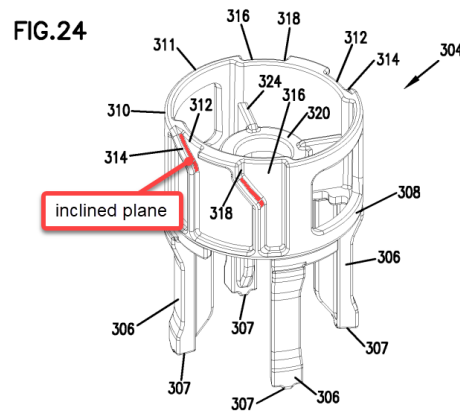
216. Thus, the inclined plane and nose are *arranged to be movable in relation to each other in such a way that they slide along each other and bring the blocking element into engagement with the eccentric opening.*

1[m]: the inclined plane being one of embodied and arranged on one of the inner circumference of the ring filter insert and the outer circumference of a filter housing part arranged inside the ring filter insert and the protruding nose being one of embodied and arranged on the other of the inner circumference of the ring filter insert and the outer circumference of the filter housing part,

217. In my opinion, Honermann discloses this limitation.

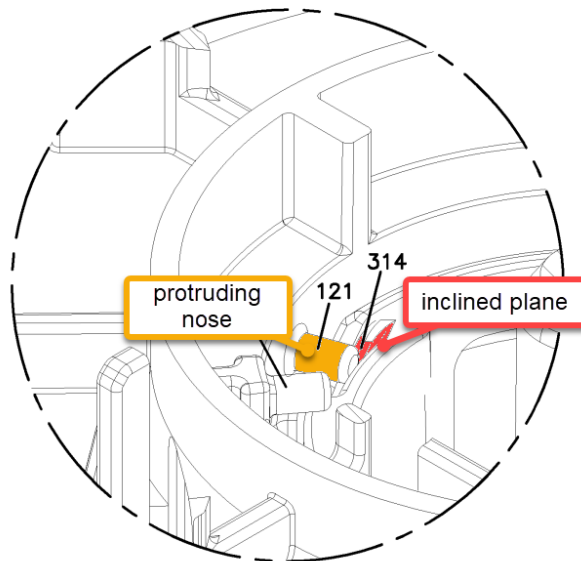
218. With respect to the limitation *“inclined plane ... embodied and arranged on ... the outer circumference of a filter housing part arranged inside the ring filter insert”*: Honermann discloses that basket 304 (i.e. *filter housing part*) has

a “grooved wall 310” which has “a first groove 312 with a first slide surface 314,” *i.e.* ***an inclined plane***. *Id.*, ¶141. These inclined planes are on the outer circumference of the basket because they are grooves within the grooved wall.

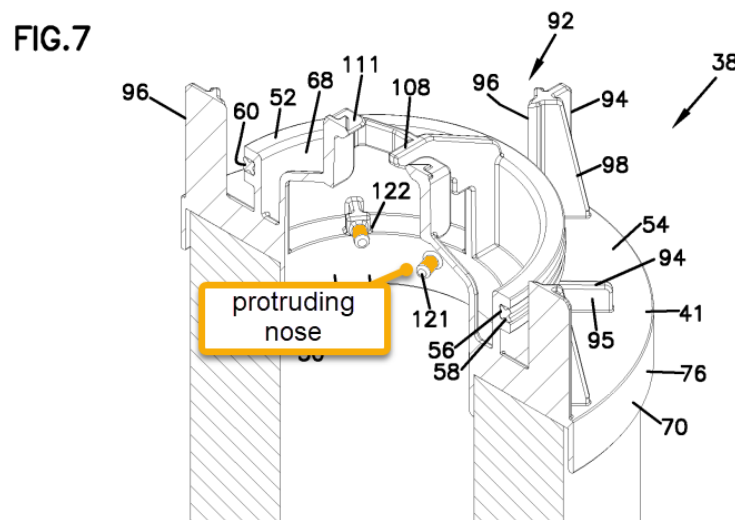


219. The basket isengages with the protrusions on the inside of the filter cartridge 38 and thus the basket is ***arranged inside the ring filter insert***. Ex. 1006, ¶143.

FIG.30



220. With respect to the limitation *“the protruding nose ... embodied and arranged on ... the inner circumference of the ring filter insert,”* Honermann discloses that “first and second protrusions 121, 122 [i.e. **protruding nose**] extend[] from the aperture wall 66” of the filter cartridge, i.e. **ring filter insert**. Ex. 1006, ¶98. As depicted in Figure 7, they are arranged on the inner circumference of the filter cartridge.

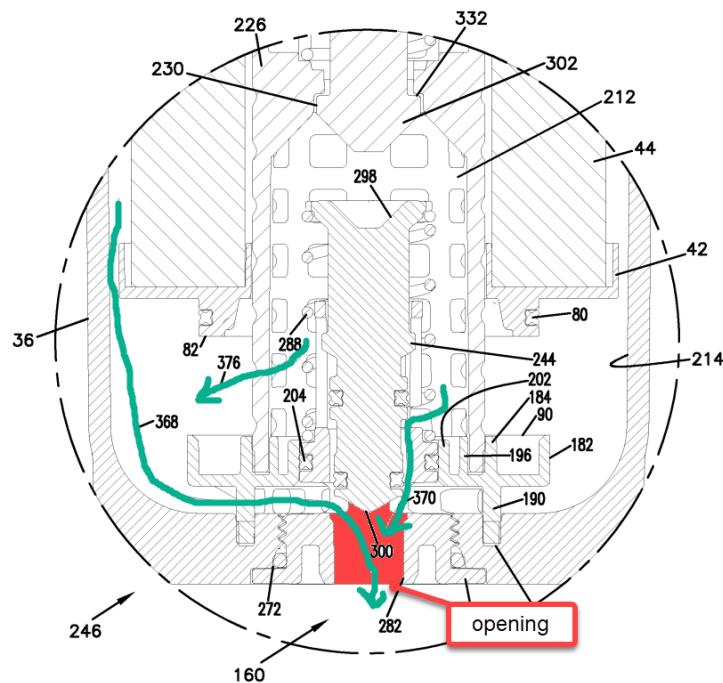


1[n]: the inclined plane comprising an incline which excludes a self-locking and

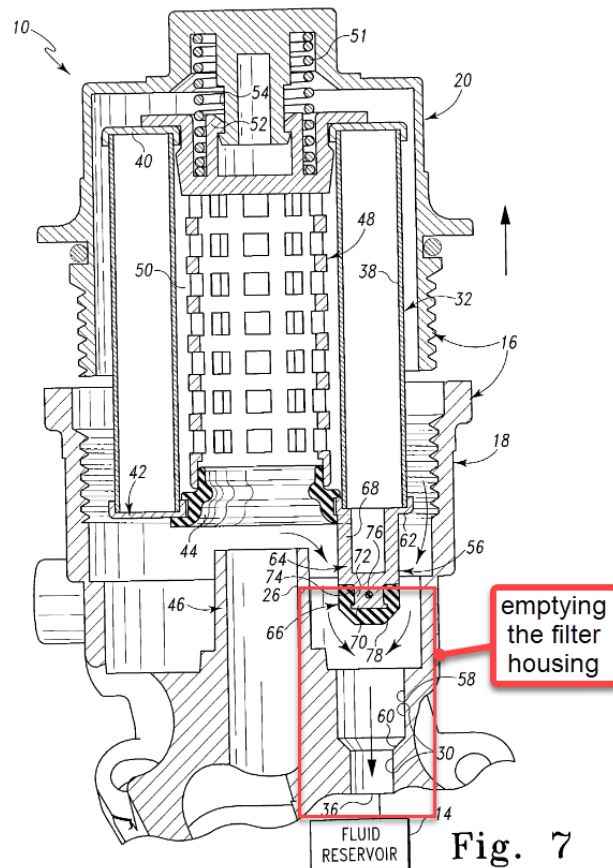
221. In my opinion, Honermann discloses this limitation. For example, Honermann discloses that as the protrusions engage with the slide surfaces, the basket rotates to an “unlocked position” which allows “additional movement of the filter cartridge 38 in a downwardly axial direction toward the closed end 156.” Ex. 1006, ¶¶179-180. Thus, the incline **excludes a self-locking mechanism**.

1[o]: the eccentric opening being an outlet for emptying the filter housing when the filter insert is removed.

222. In my opinion, Honermann in view of Cline renders obvious this limitation. For example, Honermann discloses that a “drainage aperture arrangement 160” (*i.e. eccentric opening*) that is part of a drain-valve assembly. Ex. 1006, ¶126. Honermann further teaches that “[w]hen it is time to service the filter cartridge 38,” the cartridge is removed, causing “the plug 244 to move away ... from drain port 282,” which is part of the drainage aperture arrangement. Ex. 1006 ¶189. As a result, “[t]his allows liquid to drain from both the unfiltered liquid volume 214, shown by drain path arrow 368, as well as drain from the filtered liquid volume 212 shown by drain path arrow 370,” which **empties the filter housing**. *Id.*; Fig. 10.

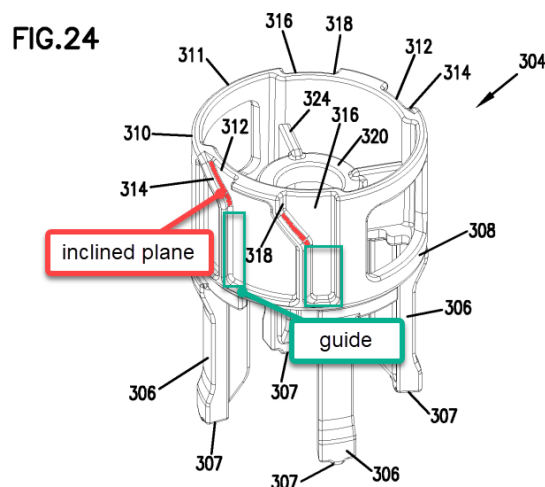


223. The Honermann-Cline combination uses Cline’s eccentric opening, and Cline likewise discloses that its opening is ***an outlet for emptying the filter housing when the filter insert is removed.*** Specifically, Cline discloses that “[t]he quick-drain valve member 56 [which includes the flow blocker] is removed from the valve chamber 58 and disengages the valve seat 60 to allow a flow of fluid from the interior region 22 through the quick-drain outlet 36 [*i.e. eccentric opening*] to the fluid reservoir 14 when the filter element 32 [*i.e. filter insert*] is ***removed from the interior region 22.***” Ex. 1009, ¶25, Fig. 7.



C. Claim 3: The liquid filter according to claim 1, including a guide for the nose which runs in an axial direction and is connected to a lower end of the inclined plane.

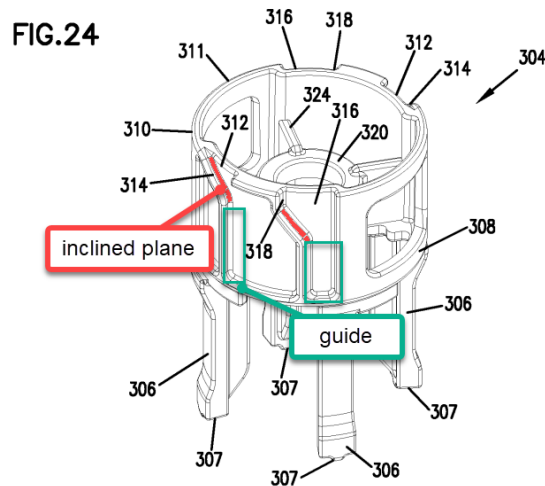
224. In my opinion, Honermann discloses this limitation. For example, Honermann discloses that as the protrusions slide on slide surfaces 314 and 318, this will “eventually allow *axial* sliding of the ... protrusion ... downwardly.” Ex. 1006, ¶179; see also ¶178 (“eventually allow the first protrusion 121 to slide down”). Figure 24 depicts the *guide for the nose* that allows the protrusion to slide down, and it runs in an *axial direction* and *is connected to a lower end of the inclined plane*.



D. Claim 5: The liquid filter according to claim 1, wherein the inclined plane is formed by one of a radially protruding rib and step, which forms a contact surface for the nose on one of an upper and lower side thereof.

225. In my opinion, Honermann discloses this limitation. For example, Honermann teaches that the inclined planes of basket 304 are formed by grooves within a grooved wall. Ex. 1006, ¶142. As depicted in Figure 24, the inclined planes are

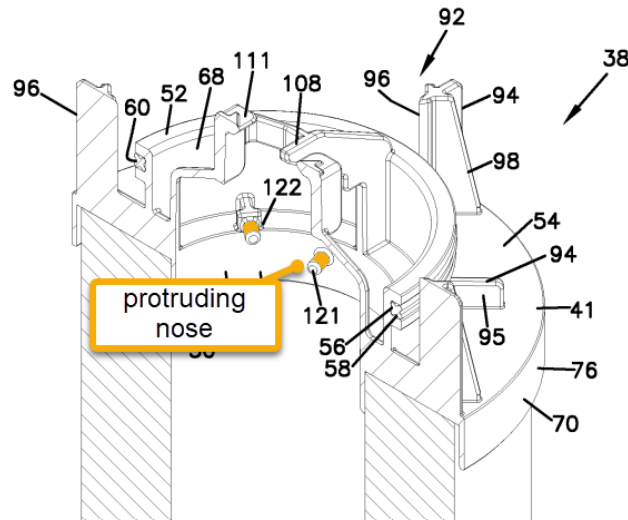
formed by a **radially protruding rib**, because the inclined plane protrudes radially from the grooved wall and is rib-shaped.



E. **Claim 8: The liquid filter according to claim 1, wherein the nose is formed integrally with one of the filter housing and the ring filter insert.**

226. In my opinion, Honermann discloses this limitation. For example, Honermann discloses that “filter cartridge 38 [*i.e. ring filter insert*] ... includes a protrusion arrangement 118,” which includes “first and second protrusions 121, 122 [*i.e. protruding nose*] extending from the aperture wall 66” of the filter cartridge. Ex. 1006, ¶98. Thus, a POSITA would understand that the protrusions are **formed integrally with the ring filter insert**.

FIG.7



- F. **Claim 9: The liquid filter according to claim 1, wherein the blocking element is one of a radially sealing valve element, an axially sealing valve element and a radially sealing plug which is one of rigidly connected to and rigidly arranged on the bottom front panel.**

227. In my opinion, Honermann in view of Cline renders obvious this limitation. As discussed above in Ground 2, Cline discloses an *axially sealing valve element* under Patent Owner's apparent construction. Cline also discloses a *radially sealing plug*. And Cline further discloses that the blocking element is *rigidly arranged on the bottom front panel*. The Honermann-Cline combination uses the Cline blocking element and drain.

- G. **Claim 10: The liquid filter according to claim 1, wherein the blocking element is an axially sealing valve element which is elastically arranged on the bottom front panel.**

228. In my opinion, Honermann in view of Cline renders obvious this limitation. As I discussed above in Ground 2, Cline discloses an *axially sealing valve element* under both Patent Owner's construction and under its plain meaning. Cline

also discloses that the blocking element is *elastically arranged on the bottom front panel*. The Honermann-Cline combination uses the Cline blocking element and drain.

H. Claim 11: The liquid filter according to claim 1, wherein the outlet comprises a seat which is one of incorporated on a side of the filter housing and is inserted as a separate part and which conforms to a shape of the blocking element.

229. In my opinion, Honermann discloses this limitation. Cline discloses that “flow blocker 66 [*i.e. blocking element*] comprises a surface 78 ... for engaging the valve seat 60 [*i.e. seat*]” and that “surface 78 and the valve seat 60 are ... frusto-conical in shape.” Ex. 1009, ¶29; Fig. 6. The valve seat therefore *conforms to a shape of the blocking element*, as also shown in Figure 6. The seat is *incorporated on a side of the filter housing* as shown in Figure 6. These elements in Cline would have been obvious to incorporate into Honermann as I explained above.

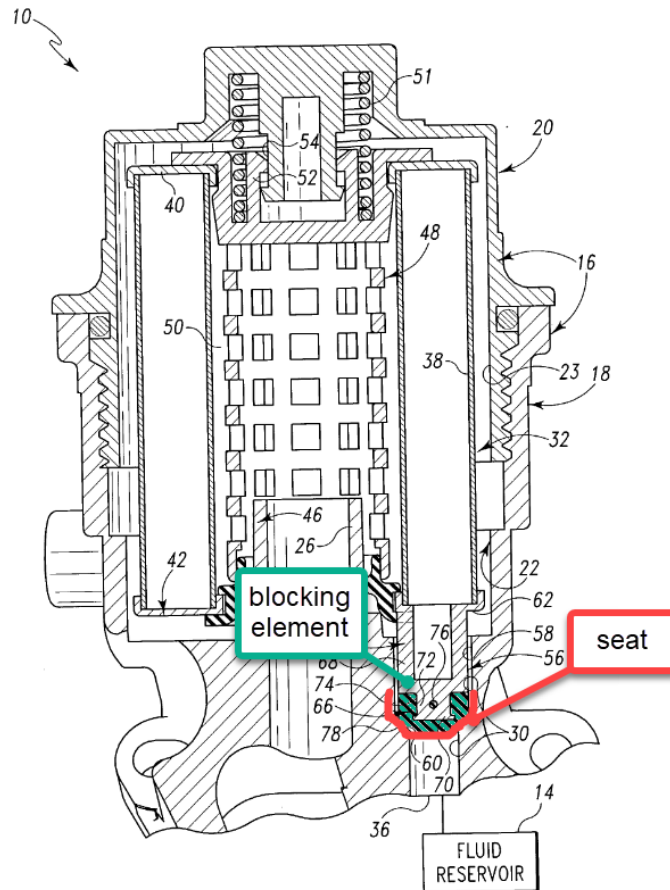
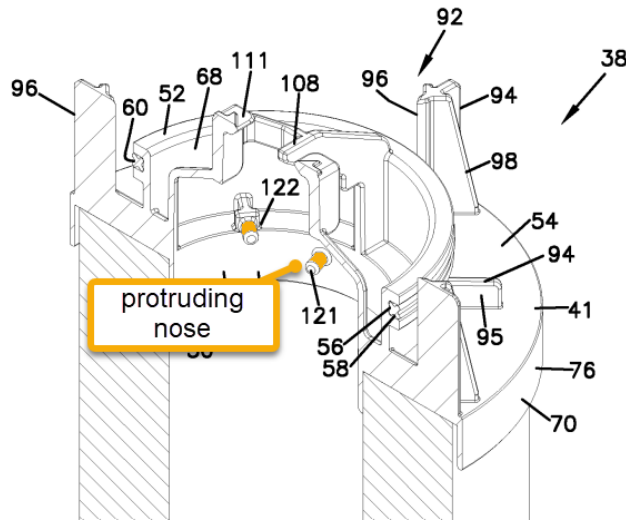


Fig. 6

I. Claim 29: The liquid filter according to claim 1, wherein the protruding nose protrudes radially.

230. In my opinion, Honermann discloses this limitation. For example, Honermann discloses that the protrusions “extend[] from the aperture wall 66 and into the first open aperture 50,” i.e. they **protrude radially**. Ex. 1006, ¶98; Fig. 7

FIG. 7



J. Claim 15

15[pre]: A ring filter insert for a liquid filter, comprising

231. In my opinion, Honermann in view of Cline renders obvious this limitation for the same reasons I gave above for limitation 1[pre] (“A liquid filter”) and 1[b] (“a ring filter insert, replaceably arranged in the filter housing”).

15[a]: A hollow-cylindrical filter material body surrounded on front sides by top and bottom front panels and which can be replaceably arranged in a filter housing,

232. With respect to “**A hollow-cylindrical filter material body surrounded on front sides by top and bottom front panels,**” in my opinion Honermann in view of Cline renders obvious this limitation for the same reasons I gave about for limitation 1[g], which recites “the ring filter insert comprising a hollow-cylindrical filter material body, surrounded on front sides by top and bottom front panels.”

233. With respect to “**which can be replaceably arranged in a filter housing,**” in my opinion, Honermann in view of Cline renders obvious this limitation

for the same reasons I gave above for limitation 1[b], which recites “a ring filter insert, replaceably arranged in the filter housing.”

15[b]: an eccentric blocking element arranged on the bottom front panel for engaging an eccentric opening in the filter housing,

234. With respect to “***an eccentric blocking element arranged on the bottom front panel for engaging an eccentric opening,***” in my opinion, Honermann in view of Cline renders obvious this limitation for the same reasons I gave above for limitation 1[h], which recites “an eccentric blocking element for the eccentric opening arranged on the bottom front panel” and limitation 1[i], which recites that the blocking element engages with the opening.

235. With respect to “***an eccentric opening in the filter housing,***” in my opinion, Honermann in view of Cline renders obvious this limitation for the same reasons I gave above for limitation 1[f], which recites “an eccentric opening arranged in a bottom of the filter housing.”

15[c]: first positioning means on the ring filter insert, which interact with second positioning means on the filter housing when the ring filter insert is inserted into the filter housing and which are arranged to bring the blocking element into engagement with the eccentric opening,

236. In my opinion, Honermann in view of Cline renders obvious this limitation for the same reasons I gave above for limitation 1[i], which recites a nearly identical limitation.

237. This limitation recites a “first positioning means” and “second positioning means” whereas limitation 1[i] recites a “first and second interacting positioning means.” However, to the extent first/second positioning means are means-plus-function terms and respectively refer to an inclined plane and nose, they have the same function and corresponding structure as “first interacting positioning means” and “second interacting positioning means,” respectively. And Honermann in view of Cline renders obvious these terms obvious for the reasons discussed above.

15[d]: the first positioning means being one of an inclined plane and a protruding nose, with the second positioning means being the other of the inclined plane and the protruding nose,

238. In my opinion, Honermann in view of Cline renders obvious this limitation for the same reasons I discussed above for limitation 1[j], which recites that the first positioning means is an inclined plane, and limitation 1[k], which recites that the second positioning means is a protruding nose.

15[e]: the inclined plane and the nose arranged to be moved in relation to each other in such a way that they slide along each other and bring the blocking element into engagement with the eccentric opening, by rotating the ring filter insert relative to the filter housing,

239. In my opinion, Honermann in view of Cline renders obvious this limitation for the same reasons I discussed above for limitation 1[l], which recites a similar limitation.

15[f]: the first positioning means being one of embodied and arranged on an inner circumference of the ring filter insert.

240. In my opinion, Honermann in view of Cline renders obvious this limitation for the same reasons I discussed above for limitation 1[m], which recites “the inclined plane being one of embodied and arranged on ... the inner circumference of the ring filter insert.”

K. Claim 17: The ring filter insert according to claim 15, including a guide for the nose which runs in an axial direction and is connected to a lower end of the inclined plane.

241. In my opinion, Honermann in view of Cline renders obvious this limitation for the same reasons I discussed above for Claim 3.

L. Claim 19: The ring filter insert according to claim 15, wherein the inclined plane is formed by one of a radially protruding rib and step which forms a contact surface for the nose on one of an upper or lower side thereof.

242. In my opinion, Honermann in view of Cline renders obvious this limitation for the same reasons I discussed above for Claim 5.

M. Claim 23: The ring filter insert according to claim 15, wherein the nose is formed integrally with the bottom front panel of the ring filter insert.

243. In my opinion, Honermann in view of Cline renders obvious this limitation for the same reasons I discussed above for Claim 8.

N. Claim 24: The ring filter insert according to claim 15, wherein the blocking element is one of a radially sealing valve element, an axially sealing valve element, and a radially sealing plug which is

one of rigidly connected to the lower front panel and rigidly arranged on the lower front panel.

244. In my opinion, Honermann in view of Cline renders obvious this limitation for the same reasons I discussed above for Claim 9.

O. Claim 25: The ring filter insert according to claim 15, wherein the blocking element is an axially sealing valve element which is elastically arranged on the bottom front panel.

245. In my opinion, Honermann in view of Cline renders obvious this limitation for the same reasons I discussed above for Claim 10.

P. Claim 28: The ring filter insert according to claim 15, wherein the blocking element is formed from two parts, the two parts of the blocking element being engaged with each other in a manner allowing a compensation of radial dimension tolerances and angle errors.

246. In my opinion, Honermann in view of Cline renders obvious this limitation. As I explained in Ground 2, Cline discloses this limitation. The Honermann-Cline combination uses this blocking element disclosed in Cline.

Q. Claim 30: The ring filter insert according to claim 15, wherein the protruding nose protrudes radially.

247. In my opinion, Honermann in view of Cline renders obvious this limitation for the same reasons I discussed above for Claim 29.

XI. DESCHAMPS RENDERS OBVIOUS CLAIMS 1, 2-3, 5-6, 8-11, 15-17, 19, 23-25, 28-30

248. As I explained above, it is my understanding that although Deschamps was filed several months before the '203 patent, Petitioners do not rely on Deschamps

as a ground of invalidity. I have been informed that Patent Owner has asserted that Deschamps is not prior art because its international application was not published in English, which I have been informed is a requirement for asserting a reference is prior art under pre-AIA Section 102(e). I do not provide any opinion as to whether or not Deschamps is prior art. However, I understand that because Deschamps was filed before the '203 patent and was published in 2011, it is evidence of the knowledge of a POSITA at the time of the '203 patent. And it is my opinion that at least the disclosures in Deschamps regarding the inclined plane/protruding nose guidance mechanism and the eccentric valve mechanism were known by a POSITA at the time of the '203 patent. I have been asked to provide an opinion as to whether Deschamps, if it was prior art, discloses or renders obvious claims 1 and 15. In my opinion, as explained below, it does.

A. Claim 1

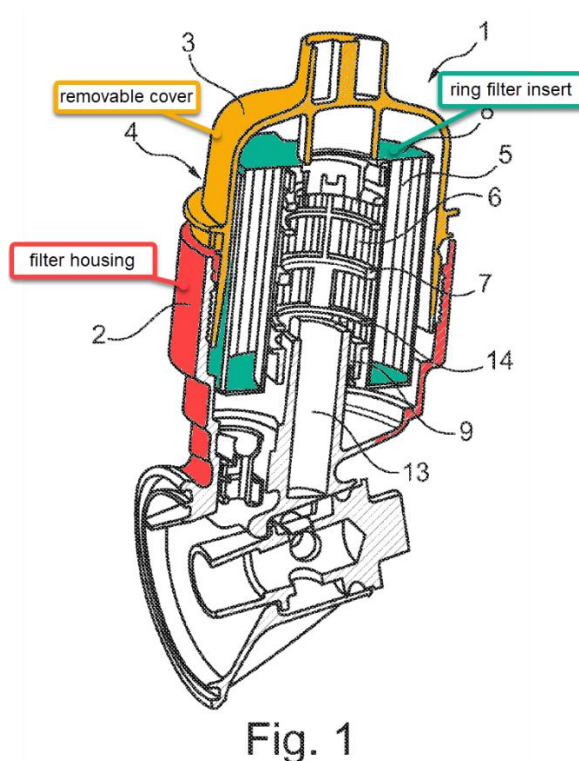
1[pre]: A liquid filter, comprising:

249. In my opinion, to the extent the preamble is limiting, Deschamps discloses this limitation. For example, Deschamps discloses “a filter device 1 according to the invention, for example an *oil or fuel filter*.” Ex. 1010, ¶33.

1[a]: a filter housing,

250. In my opinion, Deschamps discloses this limitation. For example, Deschamps discloses “filter device 1... has a filter housing 4 formed from a *filter*

housing crucible 2 [i.e. filter housing].” Ex. 1010, ¶33; Fig. 1. The below annotated Figure 1 shows the filter housing.



1[b]: a ring filter insert, replaceably arranged in the filter housing, and

251. In my opinion, Deschamps discloses this limitation. For example, Deschamps discloses that “[a]rranged inside the filter housing 4 is a **ring filter element 5**, which is known per se.” Ex. 1010, ¶33. Figure 7 depicts one such ring filter element. *Id.*, ¶19; Fig. 7. Since the “ring filter element 5 is **inserted** into the filter housing crucible 2,” this means, in my opinion, that it is a **ring filter insert replaceably arranged in the filter housing**. *Id.*, ¶35.

252. Below is Figure 7 depicting the ring filter element 5.

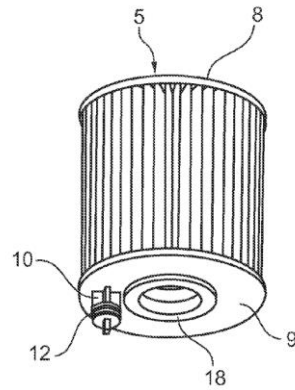


Fig. 7

253. Below is annotated Finger 1 showing how the ring filter insert is arranged in the filter housing.

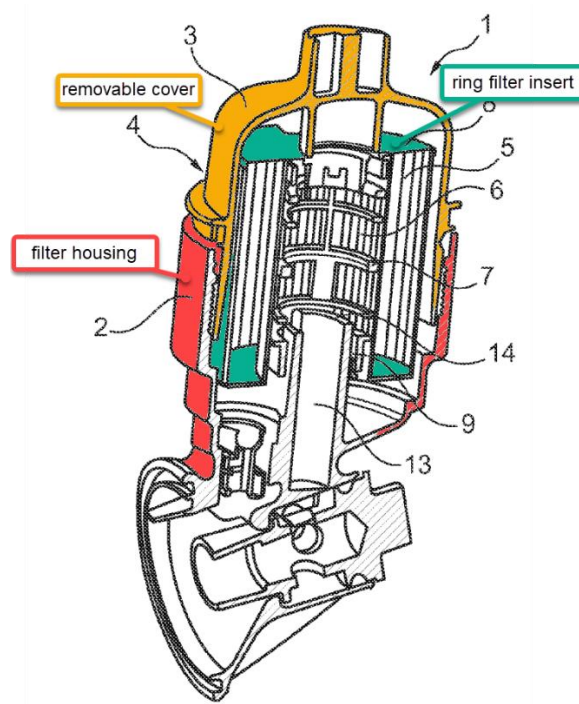


Fig. 1

1[c]: a removable cover arranged to close the filter housing during operation,

254. In my opinion, Deschamps discloses this limitation. For example, Deschamps discloses that the “filter housing 4” is “formed from a filter housing crucible 2 and a **filter housing cover 3 which can be screwed to the latter**,” which in my opinion is a removable cover. Ex. 1010, ¶33. Deschamps further discloses that the ring filter element 5 is first inserted into the housing crucible 2, after which the filter housing cover 3 is screwed on. *Id.*, ¶35. As I explain in more detail below, screwing on the housing cover results in the filter element to be locked in and sealed, and therefore ready to be used during operation. Thus, the filter housing cover 3 is **arranged to close the filter housing during operation**. Below annotated Figure 1 shows the removable cover.

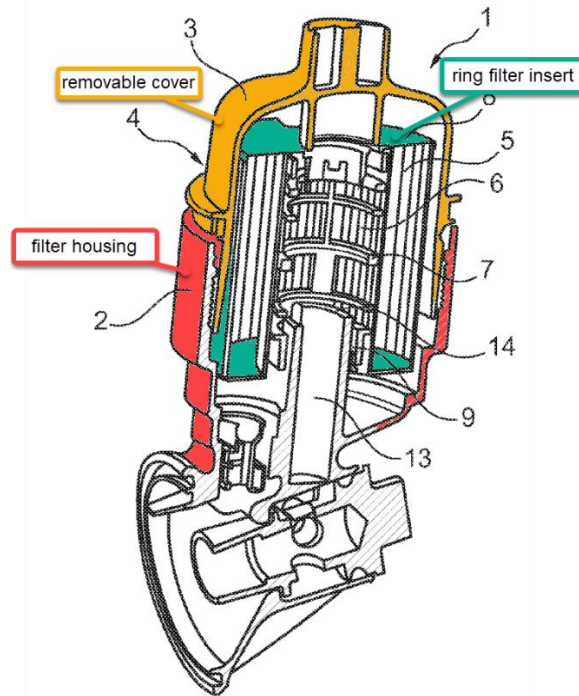


Fig. 1

1[d]: the filter housing including at least one inlet for raw liquid to be filtered, which inlet leads into a raw side of the filter housing, and

1[e]: a return extending from a clean side of the filter housing for filtered clean liquid,

255. In my opinion, Deschamps discloses or renders obvious these limitations. For example, Deschamps is directed to “a filter device, in particular an oil or fuel filter,” and particularly one for an “internal combustion engine.” Ex. 1010, ¶¶2-3. A POSITA would understand that the purpose of an oil filter is to, for example, filter out contaminants from used engine oil and to return the filtered oil back for use in the engine. As a result, there must be an inlet for used oil (*i.e. raw liquid to be filtered*) to flow into the filter to be filtered, and a *return* for the *filtered clean liquid*. Figure 18 depicts a “check valve 21” into which raw liquid flows (as indicated by

Figure 18's arrows). Ex. 1010, ¶44. A check valve is a valve that allows unfiltered oil to enter the filter while preventing unfiltered oil from escaping the filter back into the engine, especially when the engine is switched off. Thus, a POSITA would understand that the check valve depicted in Figure 18 (see below for annotated version) is an ***inlet for raw liquid to be filtered that leads into a raw side of the filter housing.***

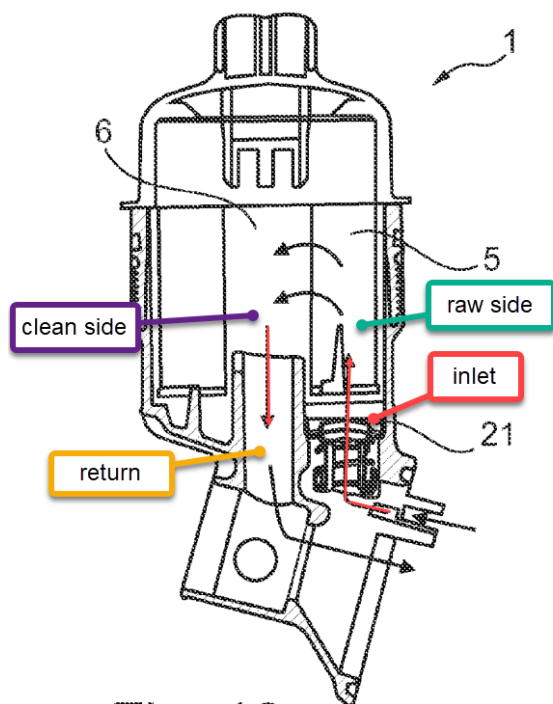


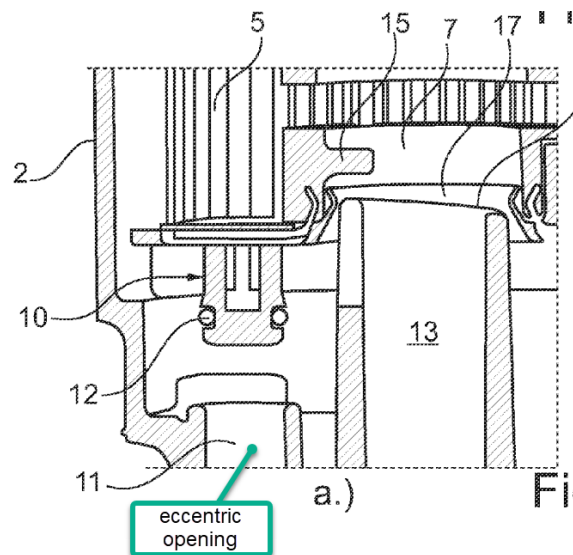
Fig. 18

256. Figure 18 further depicts that the oil is filtered into a ***clean side*** and flows through a ***return extending from the clean side***, as indicated by the arrows and the annotations. Ex. 1010, ¶34 (“[A] tube-shaped dome 13 ... engages in the inner chamber 6 of the ring filter element 5 and ... forms part of a ***clean channel*** when the filter device 1 is assembled.”). Moreover, a POSITA would have considered such an inlet and return obvious in view of Deschamps’ disclosures and depictions in Figure

18—without them, the filter would be inoperable, because the inlet allows the raw liquid to flow into the filter and the return allows the filtered liquid to flow out of the filter for further use.

1[f]: an eccentric opening arranged in a bottom of the filter housing,

257. In my opinion, Deschamps discloses this limitation. For example, Deschamps discloses “a channel 11 on the filter housing crucible side,” i.e. it is **arranged in a bottom of the filter housing**, that is sealed by a “pin 10” when the filter device is “completely assembled.” Ex. 1010, ¶33. Figure 17a depicts the channel as an **eccentric opening** (i.e. not centered) that is **arranged in a bottom of the filter housing**.



1[g]: the ring filter insert comprising a hollow-cylindrical filter material body, surrounded on front sides by top and bottom front panels, the ring filter insert separating the raw side of the filter housing and the clean side of the filter housing from each another,

258. In my opinion, Deschamps discloses or renders obvious this limitation.

259. With respect to “*the ring filter insert comprising a hollow-cylindrical filter material body*,” Deschamps shows in Figures 1 and 7 that a “known per se” ring filter element 5 (*i.e. ring filter insert*) has a *hollow-cylindrical body*. Ex. 1010, ¶33. Figure 7 also depicts that the ring filter element is comprised of *filter material*. A POSITA would understand that, with known oil or fuel filters, the folded paper-like structure depicted in Figure 7 is filter material, or at least would have considered it obvious because a filter needs filter material in order to perform the filtering function.

260. With respect to “*the ring filter insert ... surrounded on front sides by top and bottom front panels*,” Deschamps discloses that “[t]he ring filter element 5 is delimited in the axial direction in a likewise known manner by *an upper end disc 8 and a lower end disc 9*,” *i.e. top and bottom front panels*. Ex. 1010, ¶33. As depicted in Figure 7, the upper and lower disc *surround the filter material body on front sides*.

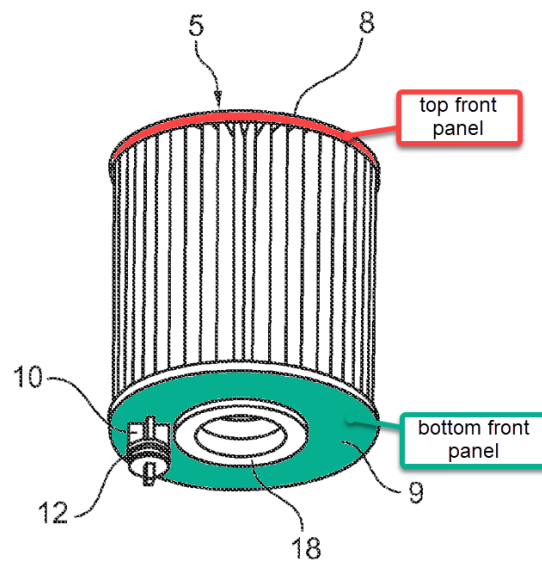


Fig. 7

261. With respect to “*the ring filter insert separating the raw side of the filter housing and the clean side of the filter housing from each another*,” as depicted in Figure 18, the ring filter element 5 *separates the raw side and the clean side of the filter housing*.

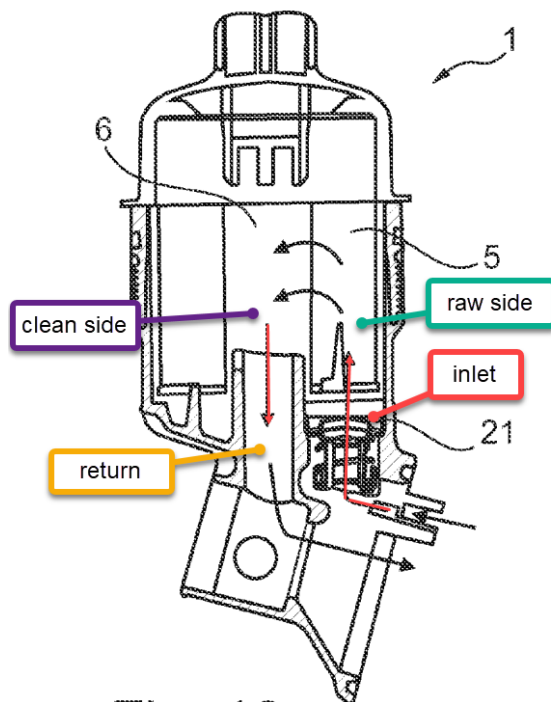


Fig. 18

1[h]: an eccentric blocking element for the eccentric opening arranged on the bottom front panel,

262. In my opinion, Deschamps discloses this limitation. For example, Deschamps discloses that “[a] pin 10 ... projects from the lower end disc 9 [*i.e. bottom front panel*] in the axial direction” and that it “engages in a leakproof manner in a channel 11 [*i.e. eccentric opening*].” Ex. 1010, ¶33. Thus, pin 10 is a **blocking**

element for the eccentric opening. As depicted in in Figure 7, pin 10 is **eccentric** and *arranged on the bottom front panel.*

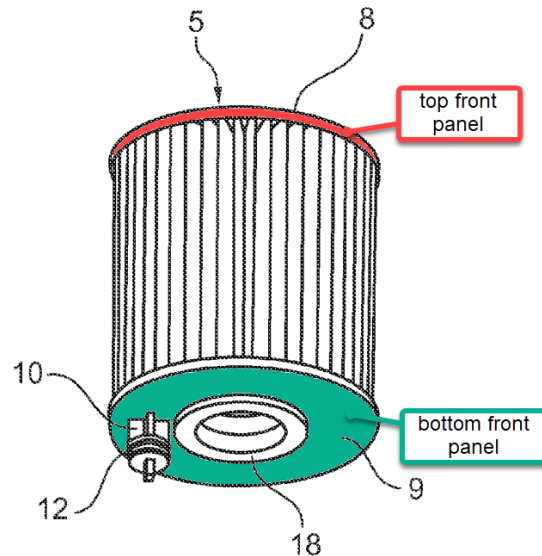


Fig. 7

1[i]: first and second interacting positioning means each on one of the ring filter insert and the filter housing and arranged to bring the blocking element into engagement with the eccentric opening when the ring filter insert is inserted into the filter housing,

1[j]: the first positioning means comprising an inclined plane,

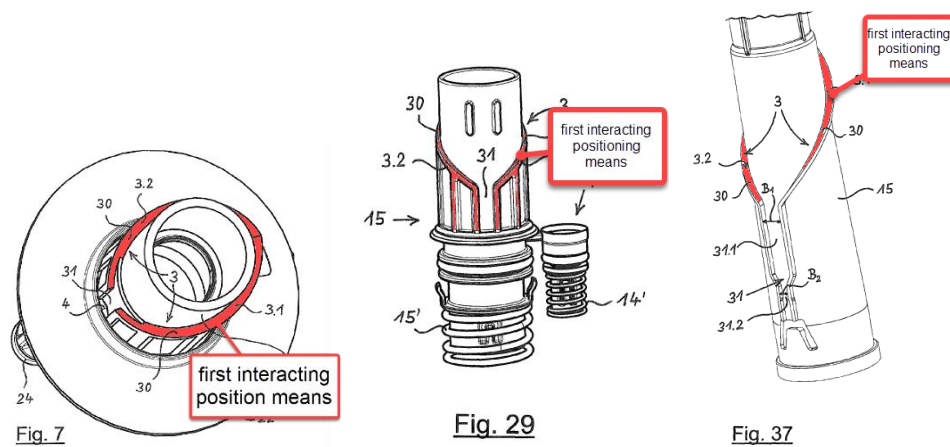
1[k]: the second positioning means comprising a protruding nose which is arranged opposite the inclined plane, and

263. In my opinion Deschamps discloses these limitations.

264. These limitations require an inclined plane and a protruding nose. The plain meaning of the claims requires that the inclined plane is either on the ring filter insert or on the filter housing, and the protruding nose is on the other.

265. In my opinion, Deschamps discloses that a first interacting positioning means (inclined plane) is on the filter housing, and the second interacting positioning means (protruding nose) is on the ring filter insert.

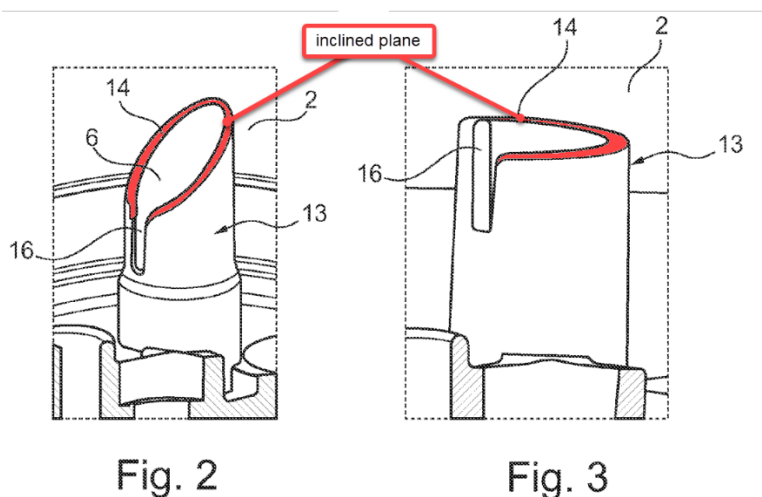
266. With respect to “*first ... interacting positioning means ... on ... the filter housing [and] comprising an inclined plane,*” as I discussed above, in my opinion, the first interacting positioning means is not a means-plus-function term because the claim elements provide sufficient structure. But as I said above, to the extent Patent Owner argues that it is a means-plus-function term, the corresponding structure I have identified is :27-51, 12:14-26, 14:34-51, Figs. 7, 29, 37, and their equivalents. These descriptions from the '203 patent describe the inclined planes depicted in the below figures.



267. The descriptions describe an inclined plane structure that is on the outer circumference of a pipe nozzle, that forms a sliding surface for nose 4, that allows

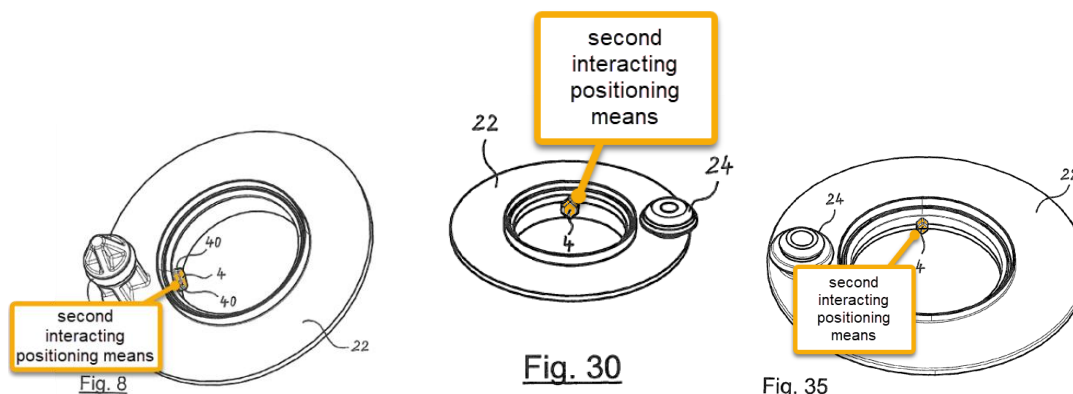
a filter insert to rotate, and that as the nose enters the axial guide 31, a blocking element enters a channel. As discussed below, this structure is disclosed by Deschamps.

268. Deschamps discloses “a tube-shaped dome 13” that is “provided on the filter housing crucible 2 [*filter housing*].” Ex. 1010, ¶33. A “guide contour 14 [*first interacting means*] is provided on a free end of the said tube-shaped dome 13, which guide contour *interacts* with a guide element 15 [*protruding nose*] arranged on the ring filter element 15.” Ex. 1010, ¶34. As depicted in Figure 2 and alternative embodiment Figure 3, the “guide contour 14” is an *inclined plane*.



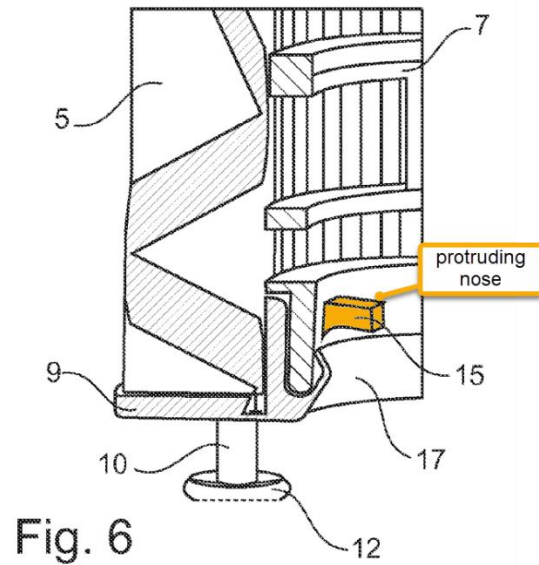
269. With respect to “*second interacting positioning means ... on ... the ring filter insert [and] comprising a protruding nose which is arranged opposite the inclined plane*,” it is again my opinion that the second interacting positioning means is not a means-plus-function term because the claim terms provide sufficient structure. But to the extent Patent Owner argues that it is a means-plus-function term, in my opinion, the corresponding structure of a second interacting position means comprising

an inclined plane on a filter housing is 8:33-51, 8:63-67, 12:36-45, 14:12-20, 14:60-64, Figs. 8, 30, 35, and their equivalents. These descriptions describe the protruding noses depicted below in Figures 8, 30, and 35, which I have annotated.

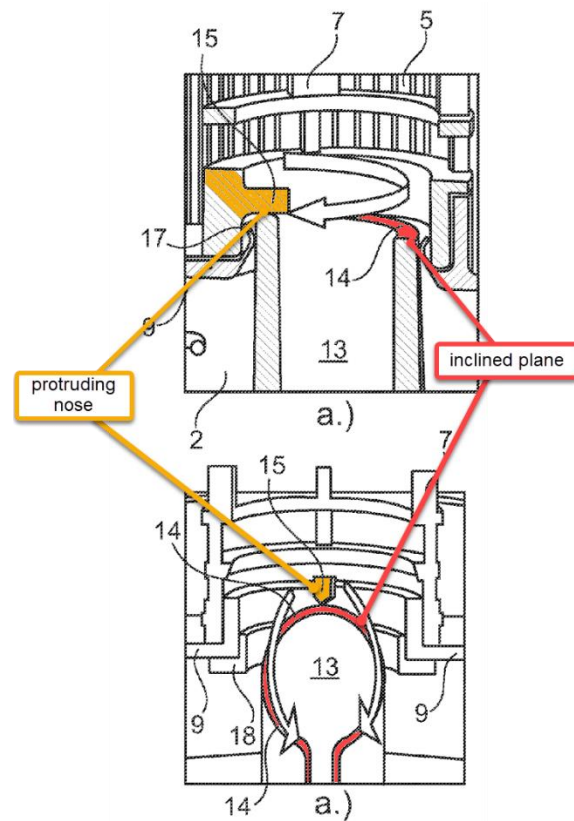


270. The descriptions describe a nose structure that is on the inner circumference of a filter insert, that slides on the surface of an inclined plane, that allows a filter insert to rotate, and that as it enters the axial guide 31, a blocking element enters a channel. As discussed below, this structure is disclosed by Deschamps.

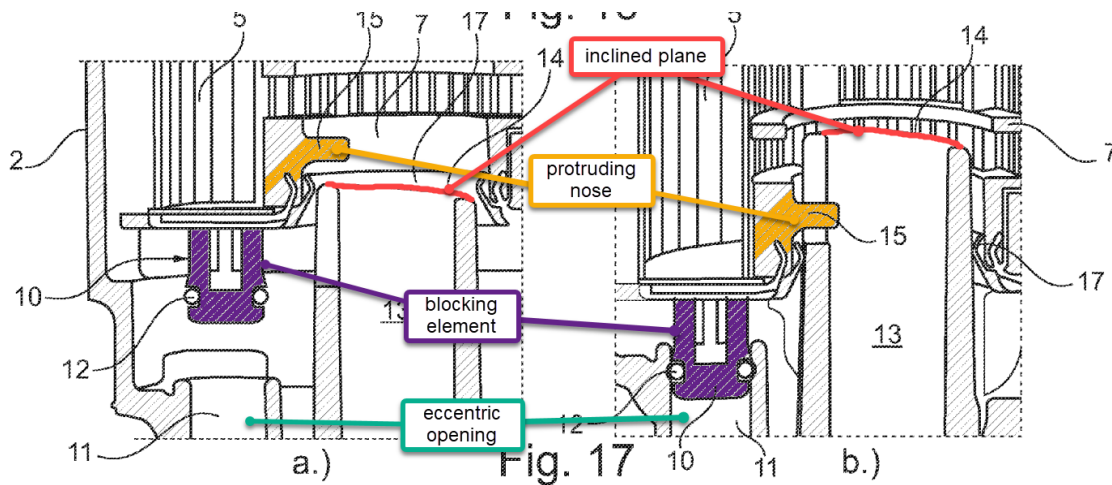
271. Deschamps discloses “a guide element 15 [***second positioning means comprising a protruding nose***] arranged on the ring filter element 5 [***ring filter insert***].” Ex. 1010, ¶15; Fig. 6.



272. Figures 4a and 5a depict that the guide element 15 (*protruding nose*) is arranged opposite the guide contour 14 (*inclined plane*).



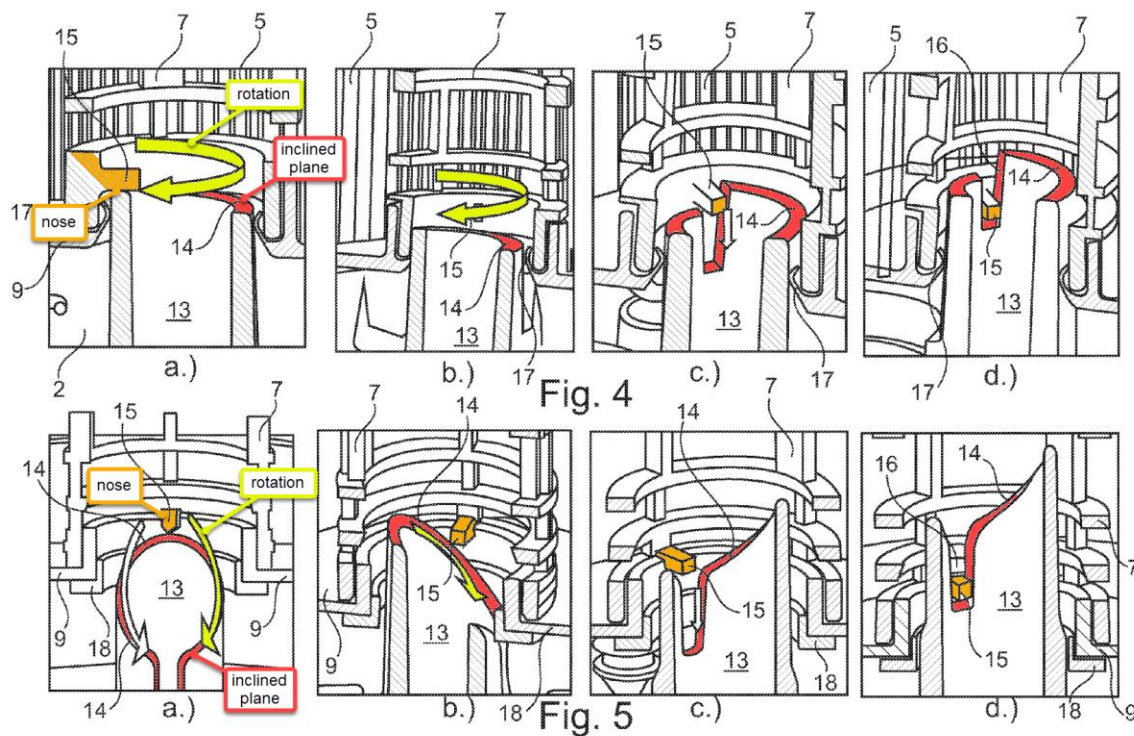
273. With respect to “*arranged to bring the blocking element into engagement with the eccentric opening when the ring filter insert is inserted into the filter housing*,” Deschamps discloses that “guide element 15 [*protruding nose*]... slides along guide contour 14 [*inclined plane*] as far as the axial groove 16” and that after guide element 15 “has reached the axial groove 16, the pin 10 [*blocking element*] is aligned coaxially flush with the channel 11 [*eccentric opening*].” Ex. 1010, ¶35. In other words, when the protruding nose slides along the inclined plane and is fixed within the groove, pin 10 will engage with channel 11 and form a seal as shown in Figure 17b.



1[l]: the inclined plane and the nose arranged to be movable in relation to each other in such a way that they slide along each other and bring the blocking element into engagement with the eccentric opening, by rotating the ring filter insert relative to the filter housing,

274. In my opinion, Deschamps discloses this limitation. For example, Deschamps discloses that “after the ring element 5 [*ring filter insert*] is inserted into

the filter housing crucible 2 [**filter housing**],” it “is ... **rotated** ... so that the guide element 15 [**nose**] ... **slides along** the guide contour 14 [**inclined plane**] as far as the axial groove 16,” after which “the pin 10 [**blocking element**] is aligned coaxially flush with the channel 11 [**eccentric opening**].” Ex. 1010, ¶35. Figures 4 and 5 show this process of **rotating the ring filter insert relative to the filter housing** to slide the nose along the inclined plane, and Figure 17 (see limitation 1[i], *supra*) depicts the **blocking element engaging with the opening**.



1[m]: the inclined plane being one of embodied and arranged on one of the inner circumference of the ring filter insert and the outer circumference of a filter housing part arranged inside the ring filter insert and the protruding nose being one of embodied and arranged on the other of the inner

circumference of the ring filter insert and the outer circumference of the filter housing part,

275. In my opinion, Deschamps discloses or renders obvious this limitation.

276. With respect to “***inclined plane ... embodied ... on ... the outer circumference of a filter housing part arranged inside the ring filter insert,***” Deschamps discloses that “guide contour 14 [***inclined plane***] is provided on a free end [***outer circumference***] of the said tube-shaped dome 13.” Ex. 1010, ¶34. Tube-shaped dome 13 “is provided on the filter housing crucible 2 [***filter housing***]” and “engages in the inner chamber 6 of the ring filter element 5” and is therefore ***a filter housing part arranged inside the ring filter insert.*** *Id.*; Figs. 4, 5, 17.

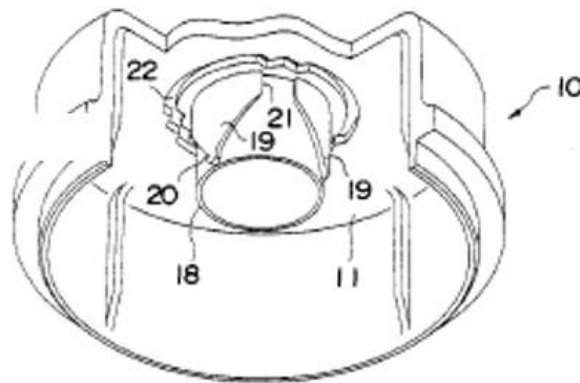
277. The inclined plane at the “free end” of the dome is an inclined plane on the ***outer circumference*** of the dome because the protrusion slides on the outside edge. Alternatively, the free end is an outer circumference because it is on the circular, distal end of the dome.

278. In addition, to the extent the first interacting positioning means is a means-plus function, it is also my opinion that the “free end” of the dome is equivalent to the inclined planes described in the corresponding structure (8:27-51, 12:14-26, 14:34-51, and Figs. 7, 29, 37). I have been informed that an “equivalent structure” is one that results from an insubstantial change which adds nothing of significance to the structure disclosed in the patent specification. Although the corresponding structure describes and depicts inclined planes that surround a wall, the inclined plane of

Deschamps that is at the “free end” is an insubstantial difference that does not affect the purpose of the inclined plane, which is the same as the purpose of the inclined planes in the ’802 patent: to provide a surface for a nose to slide so that a filter insert can rotate into position. The inclined plane in Deschamps has the equivalent function (provide a guide for the nose), way (a surface for the nose to slide), and result (the filter rotates into position) of the inclined plane in the ’802 patent. Thus, it is my opinion that Deschamps inclined planes are equivalent to the inclined planes disclosed in the ’802 patent and which provide structure to this limitation to the extent it is an MPF term.

279. I also add that, to the extent Patent Owner argues that the dome’s free end is not an “outer circumference” of the dome, a POSITA would have found it obvious to have the inclined plane be a groove on a grooved wall of the dome. Inclined planes that are part of a grooved wall were well-known, such as that disclosed in Honermann, as discussed below. Yokoyama also discloses such an inclined plane, as shown below. Ex. 1007, ¶29; Fig. 1 (depression 21).

[FIG. 1]



280. In my opinion, a POSITA would have been motivated to use a grooved wall because it would provide the known benefit of preventing leakage of filtered liquid. In Deschamps, the inclined plane is a notched out portion of the dome, which could result in leakage of filtered liquid or at least requires something to mitigate such leakage. Thus, a POSITA would be motivated to use the grooved wall of Yokoyama or Honermann. A POSITA would have also reasonably expected this modification to succeed because it would simply require forming a grooved portion of the dome's surface rather than using a notch. This would have been well within the abilities of a POSITA.

281. With respect to “*the protruding nose ... embodied and arranged on ... the inner circumference of the ring filter insert*,” Deschamps discloses that “guide element 15” (*protruding nose*) is “arranged on the ring filter element 5” (*ring filter insert*), and specifically “arranged on the inner shroud 7” (*inner circumference*) of the ring filter element. Ex. 1010, ¶¶34, 42; Figs. 4, 5, 17.

1[n]: the inclined plane comprising an incline which excludes a self-locking and

282. In my opinion, Deschamps discloses this limitation. For example, Deschamps discloses that “the ring filter element 5 can be pushed in the axial direction with the guide element 15 into the axial groove 16 [***of the inclined plane***].” Ex. 1010, ¶35. Because the guide element 15, *i.e.* ***protruding nose***, is merely pushed into the axial groove of the inclined plane and can be removed from the groove by simply pulling the filter insert away from the housing, the incline excludes a self-locking mechanism.

1[o]: the eccentric opening being an outlet for emptying the filter housing when the filter insert is removed.

283. In my opinion, Deschamps discloses this limitation. For example, Deschamps discloses that if “a ring filter element without a pin 10 is used, the channel 11 [***eccentric opening***], in particular the no-load channel, is not sealed in a leakproof manner, and a bypass flow which circumvents the ring filter element [***filter insert***] is produced.” Ex. 1010, ¶45. In other words, Deschamps teaches that if channel 11 is not sealed, it acts as a bypass flow, causing the liquid to bypass the filter and flow out of the device. Because the channel 11 allows liquid to flow out when unsealed, a POSITA would understand that the channel 11 will act as ***an outlet for emptying the filter housing when the filter insert is removed. Id.***

284. In the alternative, in my opinion, a POSITA would have found it obvious that the channel 11 empties the filter when it is not sealed by the pin. Deschamps teaches that the channel 11 becomes a bypass flow when it is not sealed, *i.e.* it allows liquid to flow out of the device while bypassing the filter. Deschamps also teaches that the channel 11 is unsealed when the filter insert is removed. A POSITA would thus be motivated to use the channel 11 as a mechanism for emptying the filter housing when the filter insert is removed, because a POSITA would find it desirable to drain excess liquid when replacing the filter insert. A POSITA would have reasonably expected this to succeed as it would require no modifications to the device.

B. Claim 15

15[pre]: A ring filter insert for a liquid filter, comprising

285. In my opinion, Deschamps discloses this limitation for the same reasons I gave above for limitation 1[pre] (“A liquid filter”) and 1[b] (“a ring filter insert, replaceably arranged in the filter housing”).

15[a]: A hollow-cylindrical filter material body surrounded on front sides by top and bottom front panels and which can be replaceably arranged in a filter housing,

286. With respect to “***A hollow-cylindrical filter material body surrounded on front sides by top and bottom front panels,***” in my opinion Deschamps discloses this limitation for the same reasons I gave about for limitation 1[g], which recites “the

ring filter insert comprising a hollow-cylindrical filter material body, surrounded on front sides by top and bottom front panels.”

287. With respect to “***which can be replaceably arranged in a filter housing***,” in my opinion, Deschamps discloses this limitation for the same reasons I gave above for limitation 1[b], which recites “a ring filter insert, replaceably arranged in the filter housing.”

15[b]: an eccentric blocking element arranged on the bottom front panel for engaging an eccentric opening in the filter housing,

288. With respect to “***an eccentric blocking element arranged on the bottom front panel for engaging an eccentric opening***,” in my opinion, Deschamps discloses this limitation for the same reasons I gave above for limitation 1[h], which recites “an eccentric blocking element for the eccentric opening arranged on the bottom front panel” and limitation 1[i], which recites that the blocking element engages with the opening.

289. With respect to “***an eccentric opening in the filter housing***,” in my opinion, Deschamps discloses this limitation for the same reasons I gave above for limitation 1[f], which recites “an eccentric opening arranged in a bottom of the filter housing.”

15[c]: first positioning means on the ring filter insert, which interact with second positioning means on the filter housing when the ring filter insert is

inserted into the filter housing and which are arranged to bring the blocking element into engagement with the eccentric opening,

290. In my opinion, Deschamps discloses this limitation for the same reasons I gave above for limitation 1[i], which recites a nearly identical limitation.

291. This limitation recites a “first positioning means” and “second positioning means” whereas limitation 1[i] recites a “first and second interacting positioning means.” However, to the extent first/second positioning means are means-plus-function terms and respectively refer to an inclined plane and nose, they have the same function and corresponding structure as “first interacting positioning means” and “second interacting positioning means,” respectively. And Deschamps renders these terms obvious for the reasons discussed above.

15[d]: the first positioning means being one of an inclined plane and a protruding nose, with the second positioning means being the other of the inclined plane and the protruding nose,

292. In my opinion, Deschamps discloses this limitation for the same reasons I discussed above for limitation 1[j], which recites that the first positioning means is an inclined plane, and limitation 1[k], which recites that the second positioning means is a protruding nose.

15[e]: the inclined plane and the nose arranged to be moved in relation to each other in such a way that they slide along each other and bring the

blocking element into engagement with the eccentric opening, by rotating the ring filter insert relative to the filter housing,

293. In my opinion, Deschamps discloses this limitation for the same reasons I discussed above for limitation 1[l], which recites a similar limitation.

15[f]: the first positioning means being one of embodied and arranged on an inner circumference of the ring filter insert.

294. In my opinion, Deschamps discloses this limitation for the same reasons I discussed above for limitation 1[m], which recites “the inclined plane being one of embodied and arranged on ... the inner circumference of the ring filter insert.”

XII. CONCLUSION

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

Executed on February 21, 2024 by:

/s/ Michael Nranian
Michael Nranian