

# **Guidebook of IP/Technology Transfer**

# **Track 1**

## **Entry-level Tech Transfer Professional**

### **Topic 1.5.5**

#### **The Triple Convergence: Technical Performance, Inventiveness, Market Relevance**

# The Triple Convergence:

the Invention “zone of success”

## *Technical Performance*

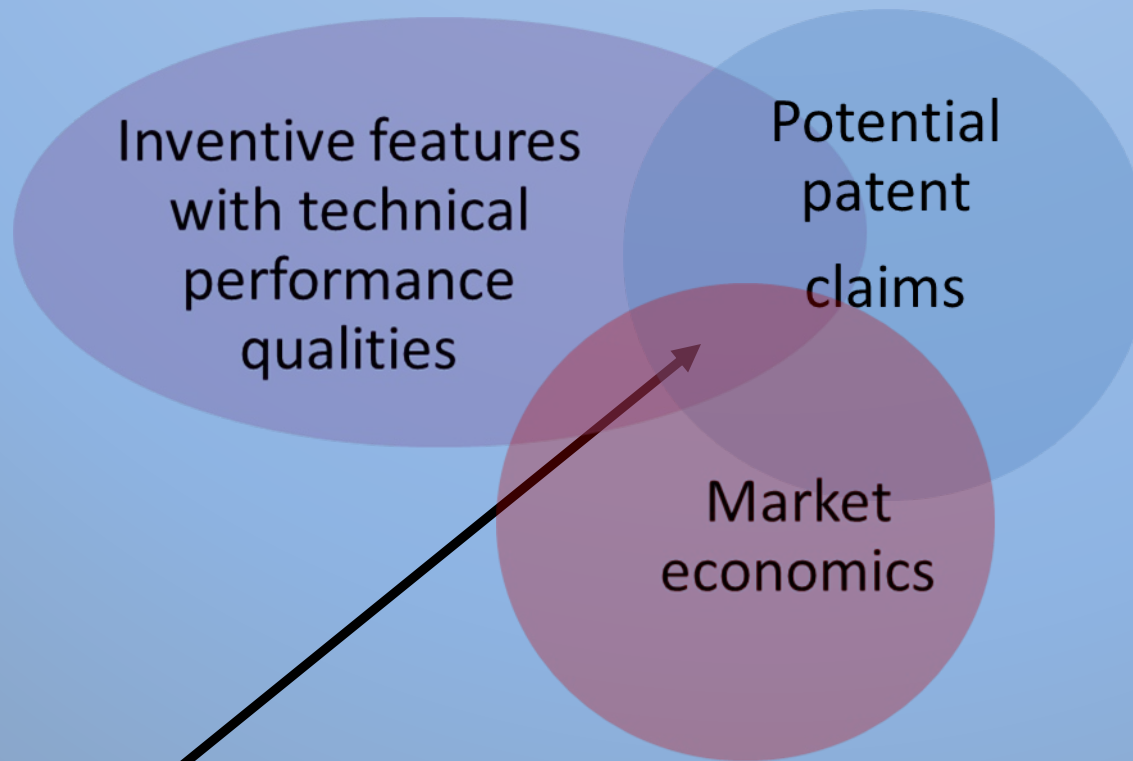
- What are the significant technical performance traits?
- Why do they confer superlative performance?
- Faster? More accurate? Better? Why?? How??

## *Inventiveness*

- What are the unique features compared to prior art?
- Do these features confer superiority/advantage?
- The basis of patent claim scope

## *Market Relevance*

- What problems do these features solve?
- Is there economic motivation for solving these problems?



The Zone of Success: inventions with superior performance, market relevant economics, and meaningful patent claims

# **Procedure for a patentability scope analysis**

1. Understand & define the invention precisely.
2. Conduct keyword-based, prior art search of patent databases & technical literature.
3. Locate the closest (most similar) patents/articles
4. Carefully compare the independent claims of the closest patents to your invention
5. Determine initial scope of patentability (if any)
6. Reconsider the invention and ALL its aspects after analyzing the prior art
7. Refine understanding and definition of the invention and scope of patentability

# Examining the closest Prior Art to define Inventiveness of your Invention

## *The Invention:*

a device that writes

under-water and upside-down

by using a finger-pressurized ink tank

and water-proof ink.

# Closest Prior Art?

## New writing device

<u>Keyword</u>	<u># of database hits</u>
Writing	75,000
Writing & ink	7,500
Writing & ink & pressurized	1,750
Writing & ink & pressurized & finger/hand	55
Writing & ink & pressurized & finger/hand & water-proof	4

# Examining the closest Prior Art to define Inventiveness of your Invention

**Invention:** *device that writes under-water and upside-down by using a finger-pressurized ink tank*

## Closest Prior Art

CN875,098: *a pressurized tattoo ink-pen*

UK3-09839: *a tool to apply paint to a car body*

IN909-498: *underwater writing device*

US9,450,750: *hand-held, pressurized-ink pen*



# Analyzing the prior art to define your inventiveness

- Use the independent claims
- Independent claims make no reference to any other claim
- Dependent claims refer to another claim
- Describe EXACTLY how your invention is different from the claim's wording

AND

- Define why that difference produces some advantage or superiority

11. The pen refill according to claim 9, wherein the first opening is formed into a slit shape.

The invention claimed is:

1. A pen comprising: an *ink* reservoir configured to store an *ink*; a pen tip having a proximal end and a distal end opposite to the proximal end, the pen tip being configured to apply an *ink* to an *ink* coating target; an *ink* guide configured to guide the *ink* in the *ink* reservoir toward the pen tip; and a holder part comprising a through hole through which the pen tip is inserted, the holder part being configured to hold at least the proximal end of the pen tip while exposing the distal end of the pen tip in the state where the pen tip is inserted through the through hole, wherein the holder part comprises: an *ink* holding part capable of holding the *ink* from the *ink* guide and formed at least partially around a circumference of the through hole; and a first opening opening on an inner circumferential surface that defines the through hole and communicating with the *ink* holding part.
2. The pen according to claim 1, wherein the *ink* holding part is formed into a slit shape.
3. The pen according to claim 1, wherein the first opening is formed into a slit shape.

# Analyzing the closest Prior Art

## defining Inventiveness

**Invention:** device that writes under-water and upside-down by using a hand-pressurized ink tank

*CN875,098: a pressurized tattoo ink-pen*

Claim 1:

*A tube for holding ink, pressurized by external gas-line connected to needle end of tattooing device.*

Differences = no finger-pressurized tank, uses an external gas-line

# Analyzing the closest Prior Art

## defining Inventiveness

**Invention:** device that writes under-water and upside-down by using a hand-pressurized ink tank

*UK3-09839: a tool to apply water-proof paint*

Claim 1:

*An elongated cylinder with attached vibrating sleeve and conical delivery port for water-proof paints and inks with high polymer content.*

Differences: no finger-pressurized ink reservoir

# Analyzing the closest Prior Art

## defining Inventiveness

**Invention:** device that writes under-water and upside-down by using a hand-pressurized ink tank

*IN909-498: underwater writing device*

Claim 1:

*A writing instrument with a reservoir of water-proof ink on one end, a rubber one-way valve on the distal end, and a metering module at the ink-delivery port.*

Differences: no finger-pressurized ink reservoir



# Analyzing the closest Prior Art

## defining Inventiveness

**Invention:** device that writes under-water and upside-down by using a hand-pressurized ink tank

*US9,450,750: hand-held, pressurized-ink pen*

Claim 1:

*A writing device which delivers ink, from a reservoir pressurized by a gas canister, to a delivery emitter by means of parallel capillary tubes.*

Differences: no finger-pressurized ink reservoir

# Refining Inventiveness in discussion with the Inventor with Prior Art context

The Invention (as originally defined): *a device that writes under water and upside down by using a pressurized ink tank and water-proof ink.*

But, what makes it work that is unique?

(compared to the prior art)



this is the heart of inventiveness

- a finger-pressurized ink tank
- Fluid flow control? emitter? Water-proof ink?
- Emitter tube rifling !!

(a surprise while discussing with inventor)



# The Invention refined in discussion with Inventor & Prior Art context

The Invention:

*a writing device with ink reservoir  
pressurized by finger-powered pump, and rifled  
fluid flow control at ink-emitter.*

# Improved Ink-Pen Invention

**Technical  
performance**

Ink-pen writes  
underwater &  
upside-down

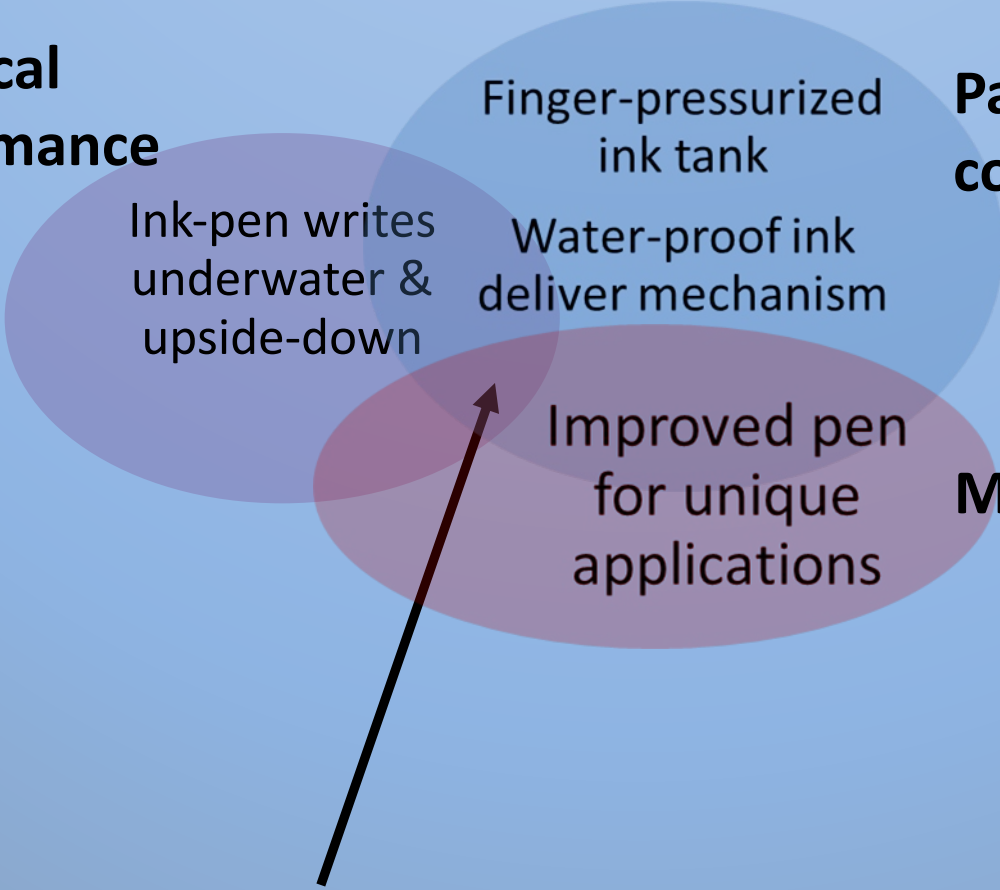
Finger-pressurized  
ink tank

Water-proof ink  
deliver mechanism

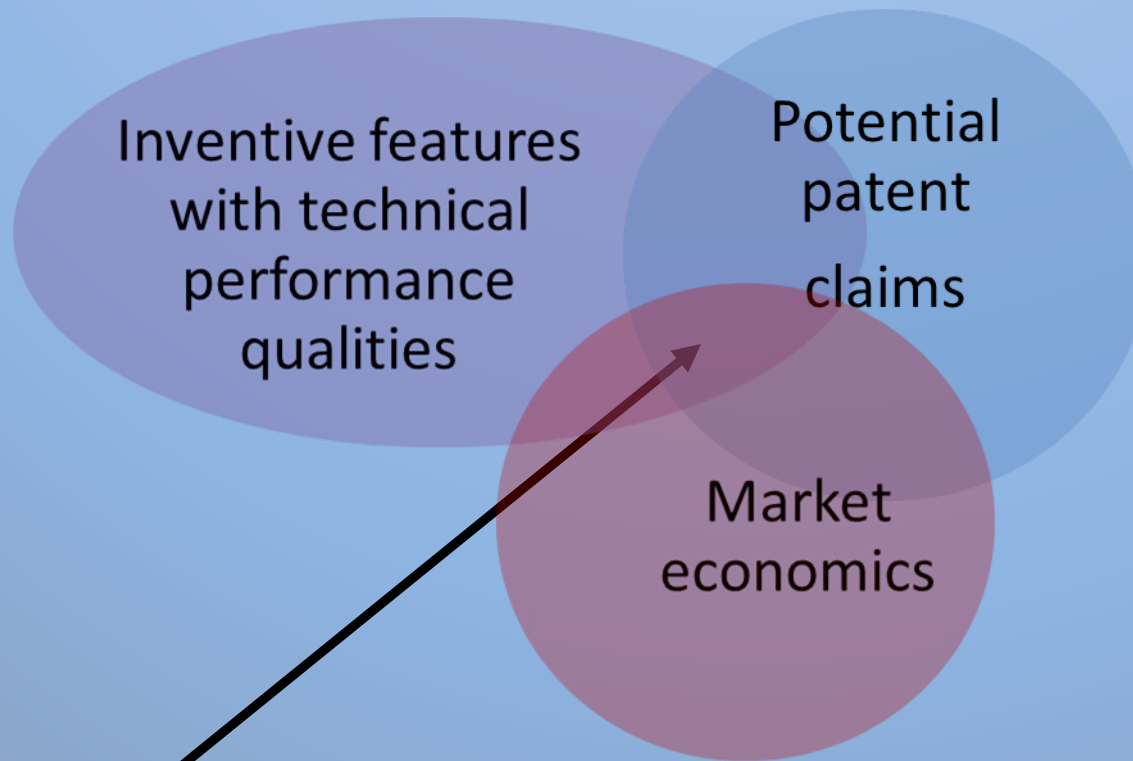
**Patent  
coverage**

Improved pen  
for unique  
applications

**Market relevance**



A protectable patent with meaningful claims that will  
produce novel products that the market wants



Zone of Success: inventions with superior performance, market relevant economics, and meaningful patent claims

# **Patent Scope, Market Relevance & Value**

The Impact of  
Patent Claim Scope  
on Market Relevance

# Scope of Claims

## **What is claimed is:**

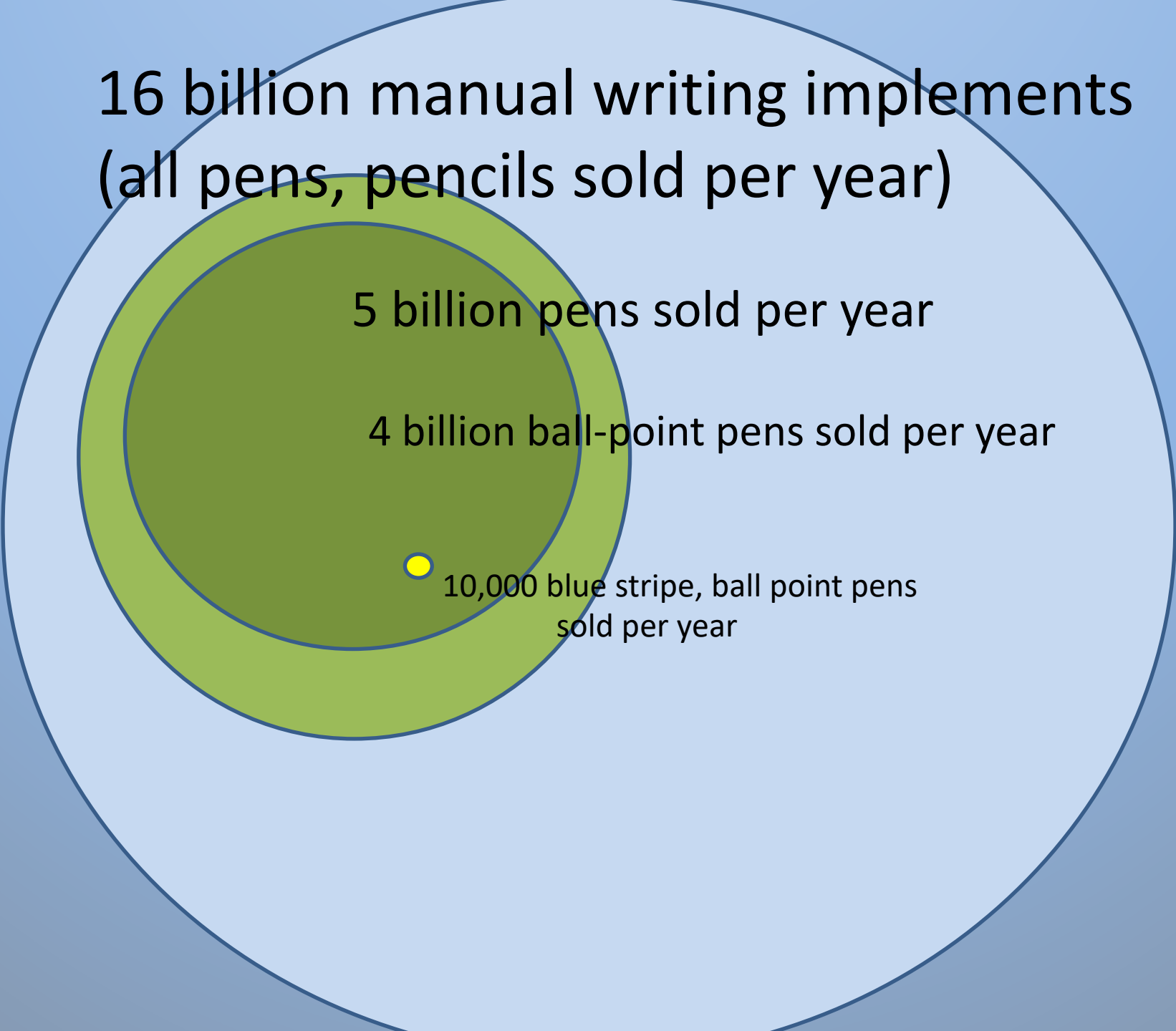
1. A writing instrument  
that is hand-held,  
cylindrical, and containing an ink reservoir,  
with a ball apparatus at one end of the cylinder  
that delivers ink from said reservoir to writing  
surface only during the act of writing,  
and wherein the ink-delivery emitter device is  
retractable,  
and the cylinder is blue-striped.

16 billion manual writing implements  
(all pens, pencils sold per year)

5 billion pens sold per year

4 billion ball-point pens sold per year

10,000 blue stripe, ball point pens  
sold per year



# Finding the triple convergence: the process

## Thoughtful evaluation and this 4-step approach:

1. Define the invention, its inventive features, and their technical performance qualities
2. Determine the Property Control Position (IP & bioproperty) quality and its relation to the performance qualities
3. Link technical performance to market relevance (economics)
4. Connect technical performance,  
Property Control Position  
market relevance,

# Case Study

## **The Invention:**

Ultrasonic mixing of baking batters and doughs



# **The Invention:**

Ultrasonic mixing of baking batters and doughs

## **What is it exactly?**

- Method and device to add ultrasonic energy into a liquid to enhance fluid mixing

## **How does it work?**

- Attachment of ultrasonic transducer to mixing bowl
- Variably adds ultrasonic energy to bowl contents via rheostat control

# **The Invention:** Ultrasonic mixing of baking batters and doughs

## ***What are the inventive features with technical performance qualities***

- Ultrasonic mixing of batters/doughs creates certain type mixing (micro-emulsions) not possible with other methods
- Ultrasonic mixing of batters creates unique rheological and structural properties of batter.....  
.... and baked product

**The Invention:** Ultrasonic mixing of batters and doughs

***Property control position quality***

- Many uses of ultrasound in prior art
- Ultrasound transducers in prior art
- Ultrasound mixing of fluids (not baking) in prior art
- No ultrasound mixing of baking batters/doughs in prior art (“unexpected result” = inventiveness)
- Specific configuration of transducer and mixing bowl not in prior art
- ✓ **Patentable:** Ultrasonic mixing of batters/doughs and specific configuration of ultrasonic transducer/mixing bowl
- ✓ **Trade Secret:** special mixing procedures

**The Invention:** Ultrasonic mixing of batters and doughs

***Property control position quality***

- Many uses of ultrasound in prior art
- Ultrasound transducers in prior art
- Ultrasound mixing of fluids (not baking) in prior art
- No ultrasound mixing of baking batters/doughs in prior art
- Ultrasound mixing in non-foods and food-related fluids
- Remember the doctrine of “unexpected result”
  - = significantly improved results (data)
  - an argument for:
  - inventiveness**

# **The Invention:** Ultrasonic mixing of baking batters and doughs

## **What is the market relevance?**

- Ultrasonically mixed batters/doughs produce baked goods:
  - without synthetic chemical additives
  - with unique mouthfeel, flavor, color, and flavor properties

## **Don't forget negative factors:**

- Ultrasonic device adds new cost to equipment
- Any significant change to baking procedure?

# Case Study: Baking technology

## **Technical features & performance characteristics**



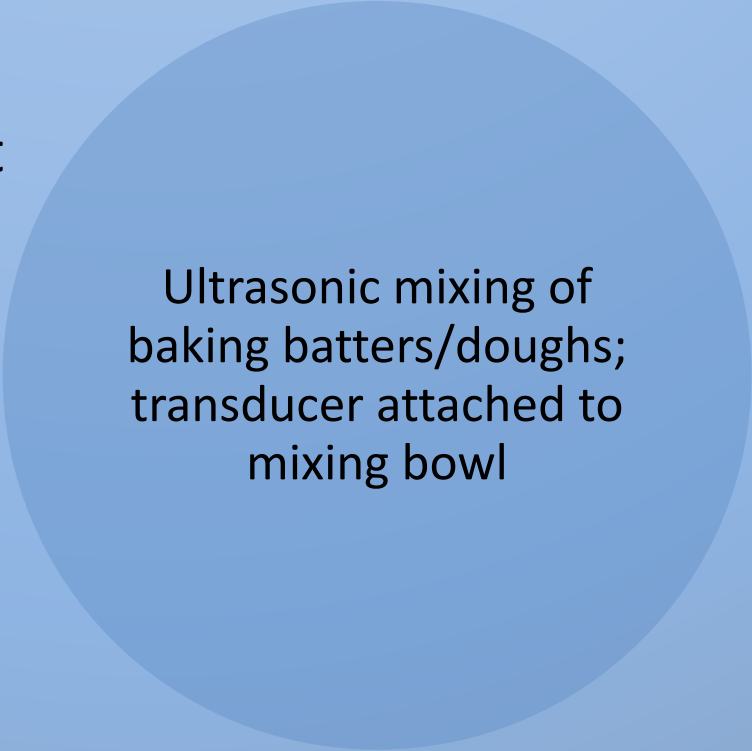
Ultrasonic  
mixing  
produces  
nanoemulsions  
in fluids

# A Case Study: Baking technology

## **Property Control Position:**

Patentability vis a vis prior art

Trade secret on procedure




Ultrasonic mixing of  
baking batters/doughs;  
transducer attached to  
mixing bowl

# A Case Study: Baking technology

## **Market relevance**

How will it enhance  
profitability?



Reduced  
manufacturing cost?

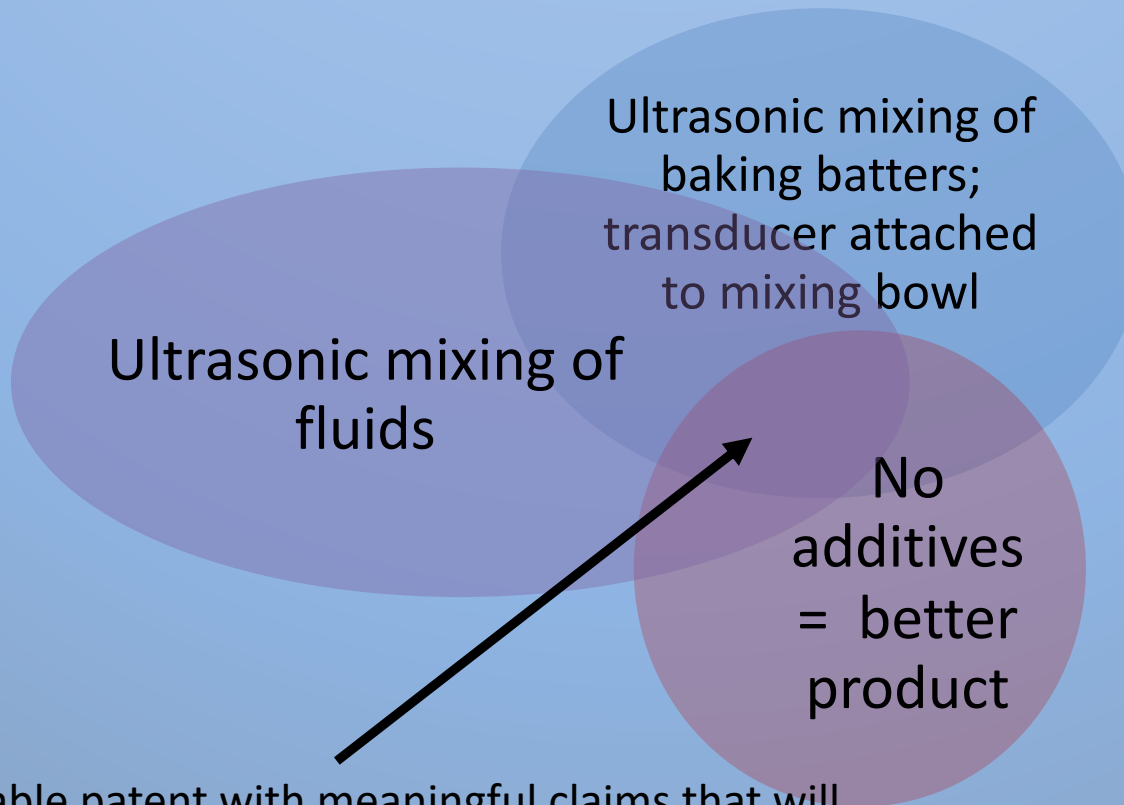
Increased  
equipment cost?

More complex  
manufacture?

No additives,  
unique products?



# Case Study: Baking technology



A protectable patent with meaningful claims that will produce novel products that the market wants

# Case Study

## The Invention:

Biodegradable, transparent film packaging made with natural materials exhibits antimicrobial and antioxidant properties

**The Invention:** Biodegradable, transparent film packaging made with natural materials that exhibits antimicrobial and antioxidant properties

## **What is it exactly?**

- Nano-emulsion of Zn-oxide nanoparticles, essential oil, surfactant, in a biopolymer (ratio of pectin/gelatin) matrix

## **How does it work?**

- Slow-release of essential oil
- Zn is also bioactive
- Mixing is critical (nano-micelles), micro-emulsion doesn't work

**The Invention:** Biodegradable, transparent film

packaging with antimicrobial, antioxidant properties

***Inventive features with technical performance qualities***

- Antimicrobial and antioxidant properties
- Can be formed into any geometry (thin film, 3-D)
- Water-soluble emulsion easy to make; water-insoluble when dried
- All materials are safe for human consumption, environmentally “friendly”
- Films are strong and elastic
- Readily biodegradable

**The Invention:** Biodegradable, transparent film packaging with antimicrobial, antioxidant properties

***Property control position quality***

- Biopolymer-based materials (pectin, chitosan, gelatin, alginate, etc) in prior art
- Biopolymer-based materials with essential oil (lemongrass, tea-tree, etc.) in prior art
- Biopolymer-based materials with essential oil and nanoparticles of Si in prior art
- ✓ **Patentable:** Materials of certain biopolymer-mixture ratios, with Zn-nanoparticles, essential oil, and surfactant; made into a nano-emulsion; nano-emulsion into films, sprays, 3-D objects
- ✓ **Trade Secret:** special mixing procedure

**The Invention:** Biodegradable, transparent film packaging made with natural materials that exhibits antimicrobial and antioxidant properties

## **What is the market relevance?**

- Antimicrobial/antioxidant packaging  
= longer food shelf-life
- Manufacture cost is low
- Strong, elastic, water-resistant
- Other applications? 3-D? biomedical devices?
- Biodegradable
- Insecticidal

**The Invention:** Biodegradable, transparent film

packaging with antimicrobial, antioxidant properties

***Link technical performance to market relevance***  
***(packaging)***

- ✓ Extended shelf-life for fruits & vegetables
- ✓ Easy to manufacture (water-soluble)
- ✓ Durable after drying (water-insoluble)
- ✓ Strong & elastic, transparent or opaque
- ✓ Cost effective

# **Invention Analysis: the process**

Thoughtful evaluation and this 4-step approach:

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and their technical performance qualities
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(IP & bioproperty) quality and its  
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***Inventive features with technical  
performance qualities***

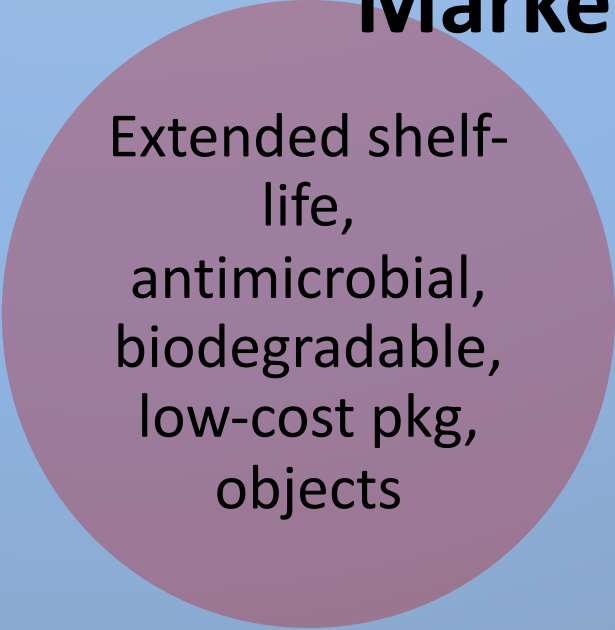
antimicrobial,  
antioxidant, water  
soluble/insoluble,  
strong&flexible  
films, objects

# Property Control Position

**Patent:** nanoemulsion: biopolymer ratios,  
Zn-nanoparticles, essential oil, surfactant

**Trade Secret:** mixing method

# Market relevance



Extended shelf-  
life,  
antimicrobial,  
biodegradable,  
low-cost pkg,  
objects

***Inventive features with  
technical performance  
qualities***

Nano-emulsions:  
antimicrobial,  
antioxidant, water  
soluble/insoluble,  
strong&flexible

**Property Control Position**

Nanoemulsion: biopolymer ratios,  
Zn-nanoparticles, essential oil, surfactant

Extended  
shelf-life,  
cheap pkg

Focus attention here



**Market relevance**

# **Track 1**

## **Entry-level Tech Transfer Professional**

### **Topic 1.5.5**

## **The Triple Convergence: Technical Performance, Inventiveness, Market Relevance**

**Thank you**