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Prior Art Report

Prepared by: Robert Lovin

Date: 4/14/2026

Idea: A retail shelf system that automatically tracks inventory levels and adjusts pricing in real-time based on demand, expiration, and store traffic.

Integration with POS systems, Customer-facing digital price labels
Analytics dashboard for demand patterns

Executive Summary

A shelf-level IoT system for grocery and convenience stores that fuses embedded weight sensors and computer vision to track item-level inventory in real time, then automatically adjusts on-shelf prices based on demand, time-to-expiration, and store traffic. The platform ties into POS and electronic shelf labels for instantaneous price display, issues real-time restock alerts and suggestions, and exposes an analytics dashboard for demand patterns and waste reduction insights. Intended outcomes are reduced food waste, improved margin capture via dynamic markdowns, and streamlined replenishment workflows.

In novelty terms this concept is moderately novel. Technically, most building blocks (load sensors, camera-based object detection, POS integration, electronic shelf labels, dynamic pricing algorithms) are established, but the specific combination—real-time shelf-level sensor fusion that drives expiration-aware dynamic pricing and prescriptive restocking recommendations—is less common and represents a meaningful technical integration challenge. From a UX perspective the novelty is lower to moderate: consumer-facing dynamic price displays and visible price reductions are familiar (electronic shelf labels, promotions), but tight coupling of on-shelf price changes to real-time expiration and traffic data creates a distinct shopper experience.

DIfferentiators

- Fusion of embedded weight sensors and computer vision for item-level presence and count at the shelf (sensor redundancy for higher accuracy)
- Real-time dynamic pricing explicitly tied to time-to-expiration (automated markdowns as shelf-life shortens)
- Demand- and traffic-aware price adjustments (using store traffic signals to modulate pricing cadence)
- End-to-end POS integration so shelf prices, transactions, and inventory remain synchronized
- Customer-facing electronic shelf labels that update instantaneously in response to sensor/algorithm output
- Prescriptive restocking alerts and restock-suggestion engine based on live shelf state and demand forecasts
- Analytics dashboard exposing demand patterns, waste metrics, and pricing effectiveness for store operators

Prior Art

Top Patent References

Location assignment system and method

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US10387947B2

Dates

- Priority: 2014-04-10
- Filing: 2017-09-12
- Publication: 2019-08-20
- Grant: 2019-08-20

Summary

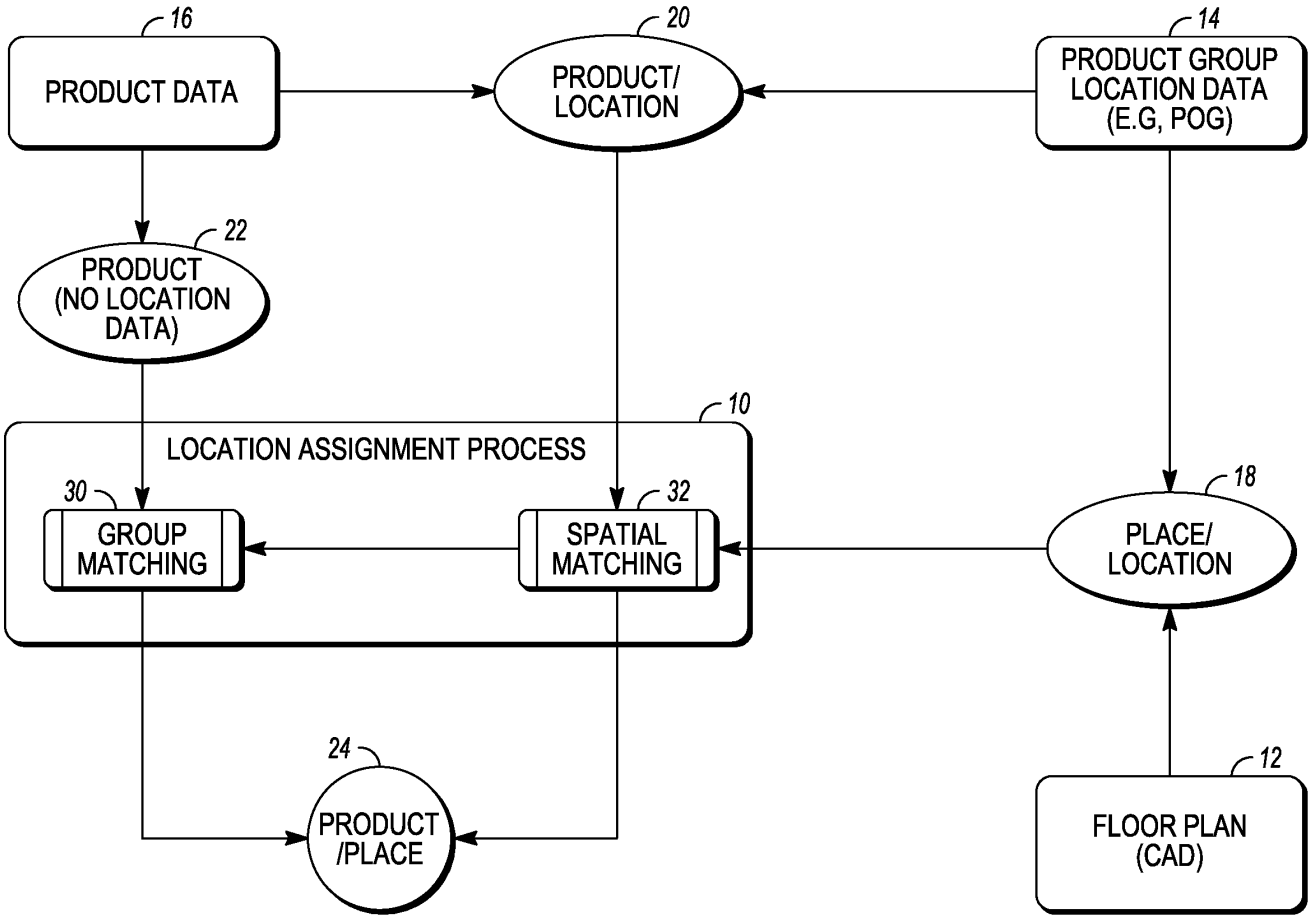
Key Details

- Inventor: Jonathan Alan Croy
- Assignee: Point Inside, Inc.

Links

- Patent: https://patents.google.com/patent/US10387947B2/en
- PDF: https://patentimages.storage.googleapis.com/0d/30/97/cc69906209f917/US10387947.pdf

Figures



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Interactive transaction system, method, and device for physical merchant stores

US11176602B2

Dates

- Priority: 2015-02-20
- Filing: 2019-10-15
- Publication: 2021-11-16
- Grant: 2021-11-16

Summary

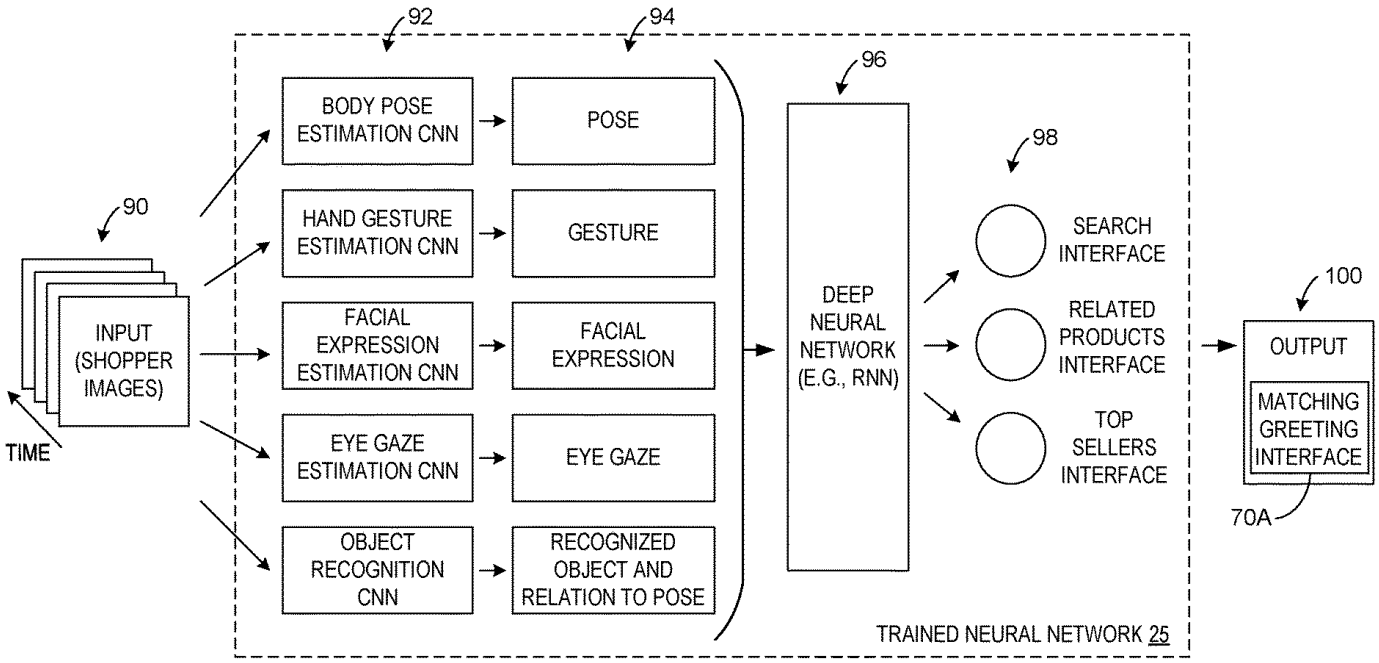
Key Details

- Inventor: Herb Sorensen
- Assignee: Shopper Scientist Llc

Links

- Patent: https://patents.google.com/patent/US11176602B2/en
- PDF: https://patentimages.storage.googleapis.com/9c/a1/4d/690599a3724752/US11176602.pdf

Figures



RFID based product level availability

US7940181B2

Patntr.ai

Dates

- Priority: 2007-02-01
- Filing: 2008-01-31
- Publication: 2011-05-10
- Grant: 2011-05-10

Summary

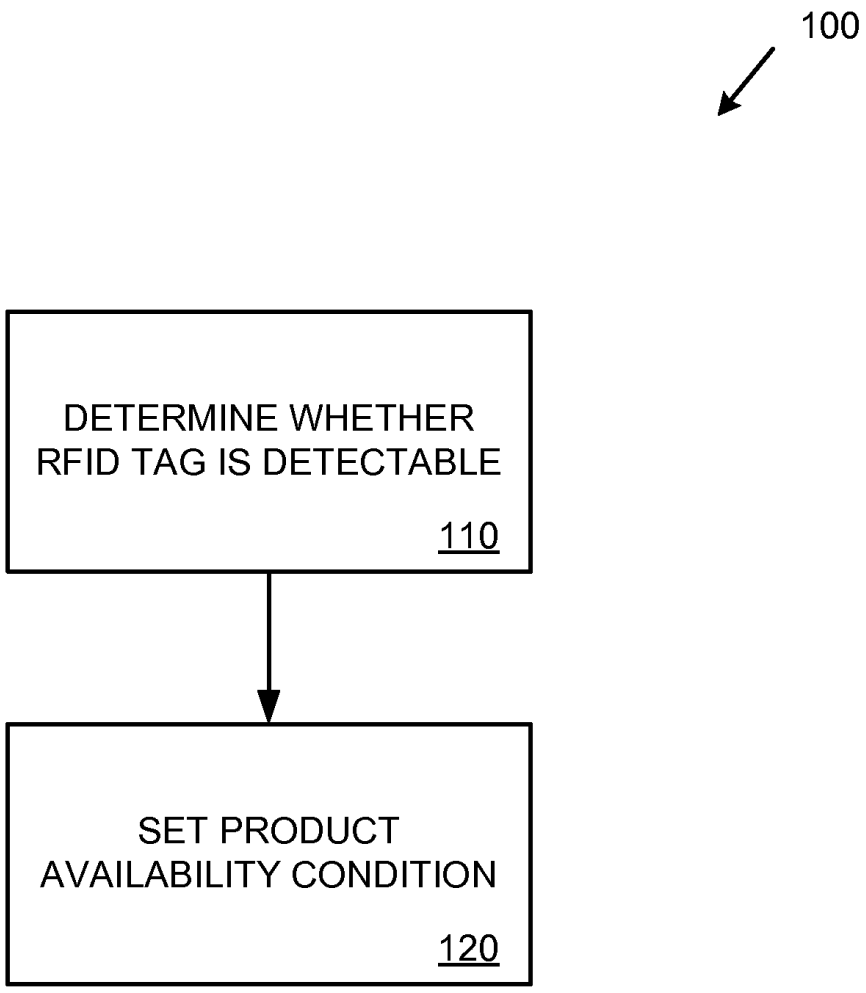
Key Details

- Inventor: Girish A. Ramachandra
- Assignee: Infosys Technologies Ltd.

Links

- Patent: https://patents.google.com/patent/US7940181B2/en
- PDF: https://patentimages.storage.googleapis.com/ec/00/ea/111dd2a78cdb17/US07940181.pdf

Figures



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Digitally managed shelf space marketplace

US11810067B2

Dates

- Priority: 2019-12-31
- Filing: 2020-12-31
- Publication: 2023-11-07
- Grant: 2023-11-07

Summary

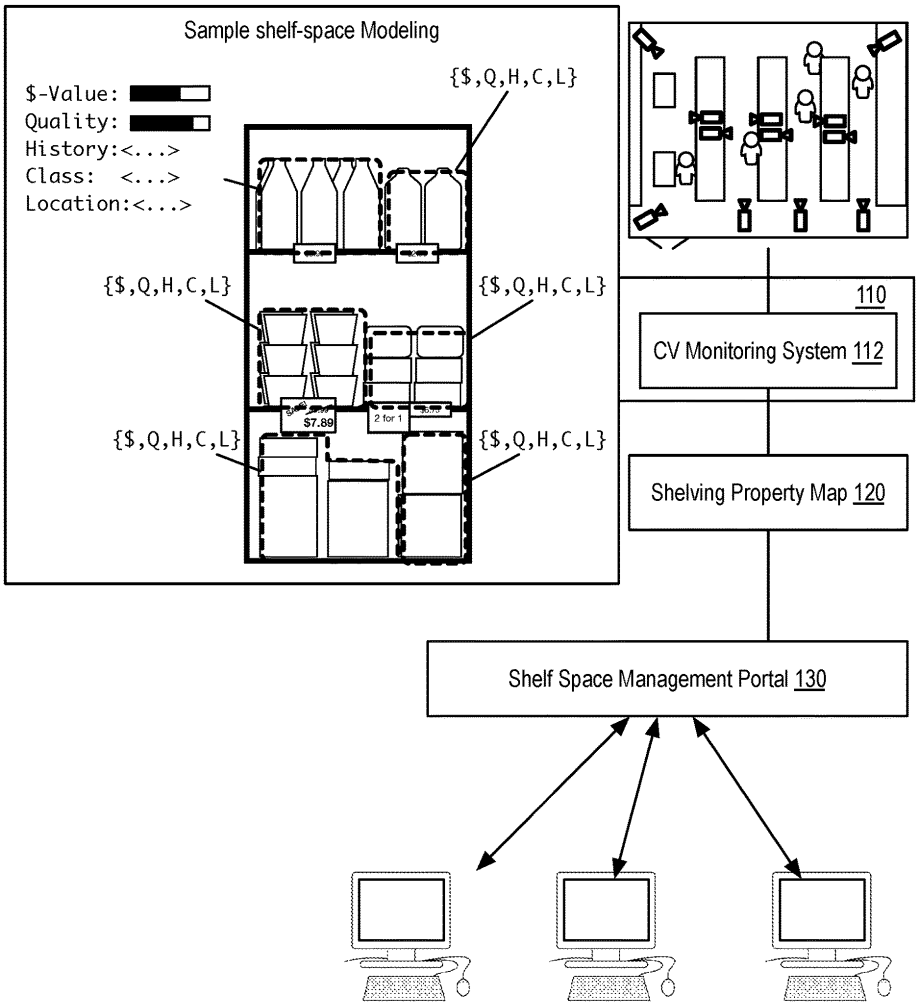
Key Details

- Inventor: William Glaser
- Assignee: Grabango Co.

Links

- Patent: https://patents.google.com/patent/US11810067B2/en
- PDF: https://patentimages.storage.googleapis.com/48/2d/ab/a1245420703f72/US11810067.pdf

Figures



Users Placing bids/orders for shelf-space usage options

Method and apparatus for optimizing a multi-dimensional space

WO2014049306A1

Dates

- Priority: 2012-09-28
- Filing: 2012-09-28
- Publication: 2014-04-03

Summary

Key Details

- Inventor: Matthew Elliot GOULD
- Assignee: Sqi3 Solutions Limited

Links

- Patent: https://patents.google.com/patent/WO2014049306A1/en
- PDF: https://patentimages.storage.googleapis.com/de/f7/ed/89dd77e3b0be3f/WO2014049306A1.pdf

Remote SKU On-Boarding of Products for Subsequent Video Identification and Sale

Patntr.ai

US20240144340A1

Dates

- Priority: 2019-02-17
- Filing: 2023-09-28
- Publication: 2024-05-02

Summary

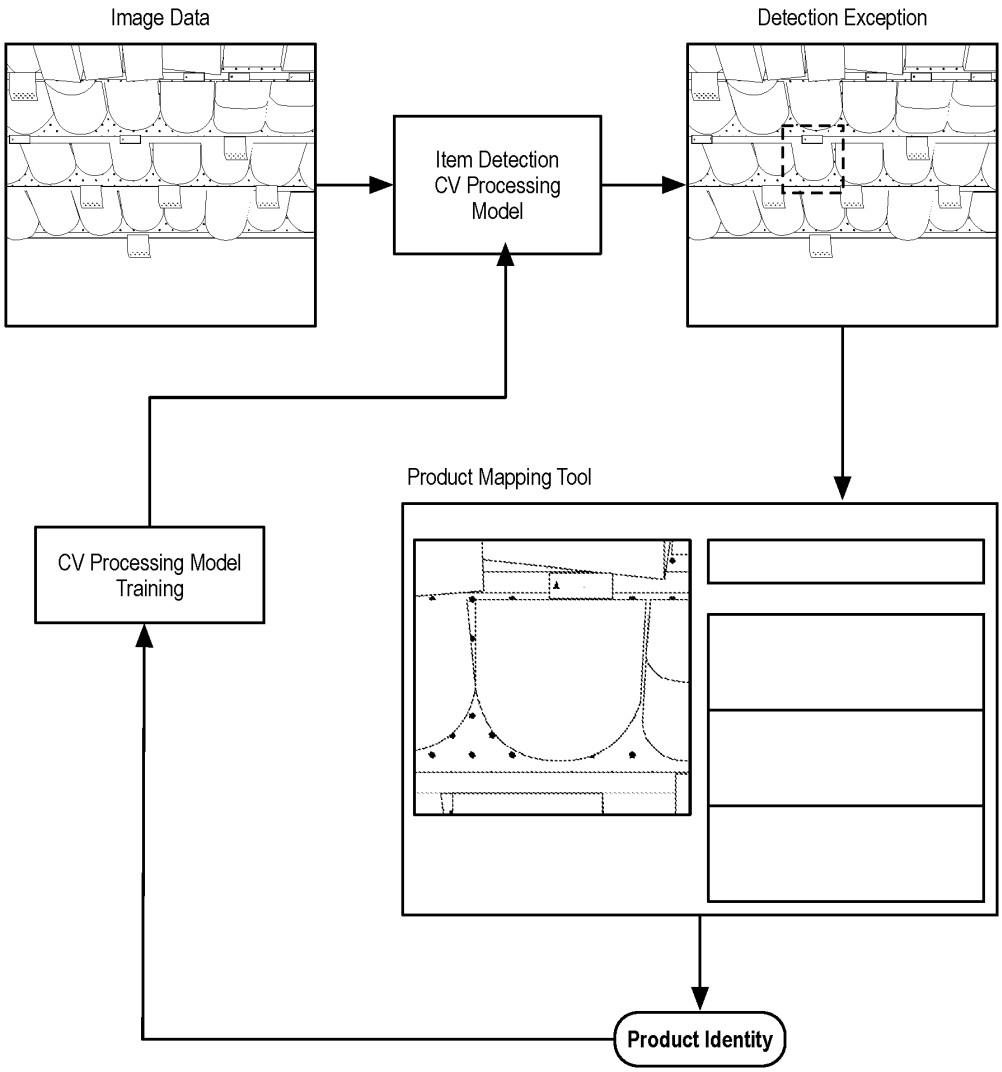
Key Details

- Inventor: William Glaser
- Assignee: Grabango Co.

Links

- Patent: https://patents.google.com/patent/US20240144340A1/en
- PDF: https://patentimages.storage.googleapis.com/34/14/ef/2b9286d437c7e8/US20240144340A1.pdf

Figures



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Method and apparatus for forecasting an optimized multi-dimensional space

WO2014049303A1

Dates

- Priority: 2012-09-28
- Filing: 2012-09-28
- Publication: 2014-04-03

Summary

Key Details

- Inventor: Matthew Elliot GOULD
- Assignee: Sqi3 Solutions Limited

Links

- Patent: https://patents.google.com/patent/WO2014049303A1/en
- PDF: https://patentimages.storage.googleapis.com/c7/a1/ab/bfcba24dc6a362/WO2014049303A1.pdf

Systems and methods for increasing data migration and accessibility

JP2023529350A

Dates

- Priority: 2020-06-03
- Filing: 2021-06-02
- Publication: 2023-07-10

Summary

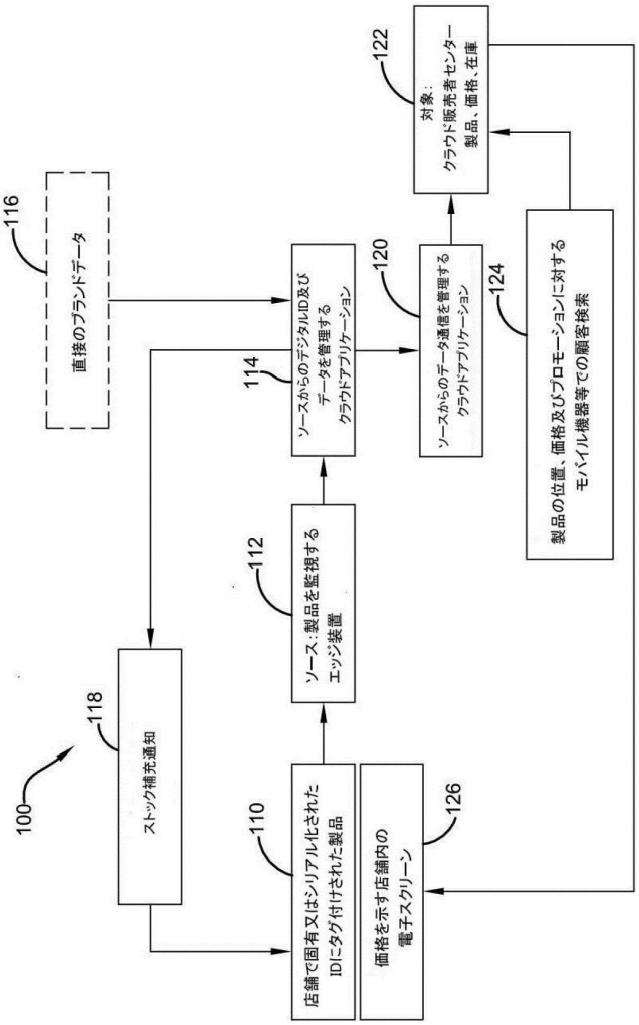
Key Details

- Inventor: 0Ö0ì0Ã0¯0Þ0óÿ 0Õ0ì0Ç0ê0Ã0¯
- Assignee: 0¨0¤0ô0§0ê0ü 0Ç0Ë0½0ó 0ê0Æ0ü0ë 0¤0ó0Õ0©0á0ü0·0ç0ó 0µ0ü0Ó0·0º 0ê0ß0Æ0Ã0É 0é0¤0¢0

Links

- Patent: https://patents.google.com/patent/JP2023529350A/en
- PDF: https://patentimages.storage.googleapis.com/ec/66/eb/de9ef03e4a569a/JP2023529350A.pdf

Figures



Method and apparatus for optimizing a multi-dimensional space

US20150199627A1

Dates

- Priority: 2012-09-28
- Filing: 2015-03-27
- Publication: 2015-07-16

Summary

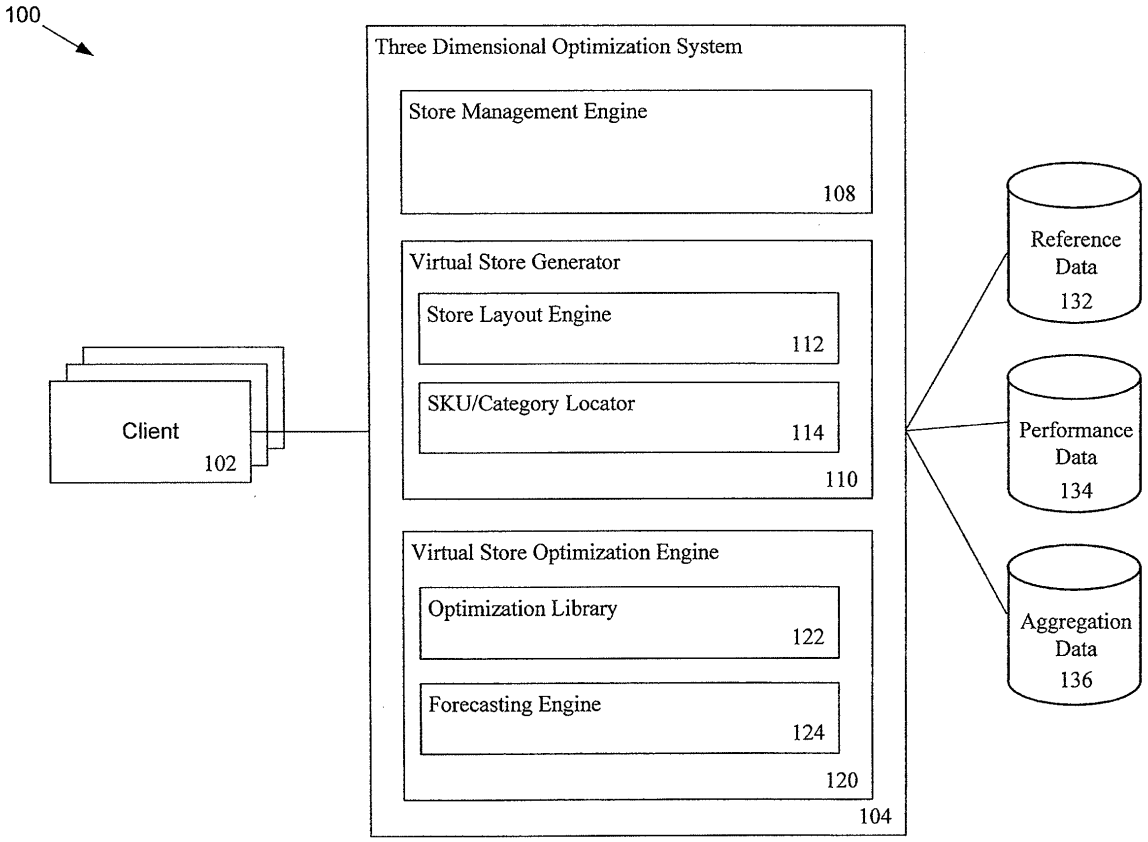
Key Details

- Inventor: Matthew Elliot GOULD
- Assignee: Sqi3 Solutions Limited

Links

- Patent: https://patents.google.com/patent/US20150199627A1/en
- PDF: https://patentimages.storage.googleapis.com/d3/75/aa/085bf312ed8634/US20150199627A1.pdf

Figures



Visual Indicator of Frictionless Status of Retail Shelves

US20220358817A1

Dates

- Priority: 2020-10-13
- Filing: 2022-07-25
- Publication: 2022-11-10

Summary

Key Details

- Inventor: Youval Bronicki
- Assignee: Trax Technology Solutions Pte Ltd.

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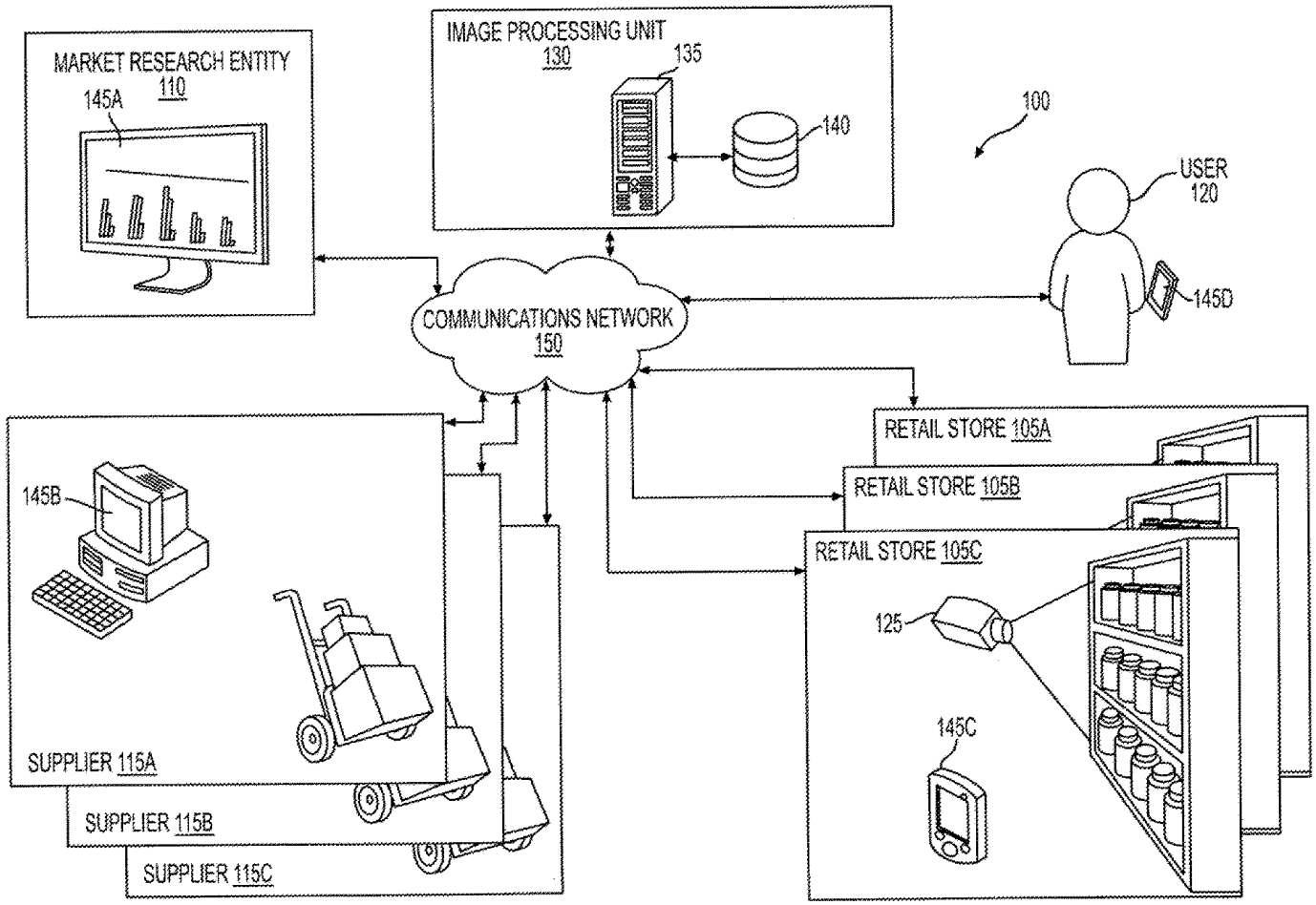
Links

- Patent: https://patents.google.com/patent/US20220358817A1/en
- PDF: https://patentimages.storage.googleapis.com/8d/a9/5d/1ebe66a771ed02/US20220358817A1.pdf

Figures



Supporting Patent Classes (CPC)

CPC Suggestions

- G06Q10/06 — Resources, workflows, human or project management
- G06Q30/00 — Commerce
- G01G19/00 — Weighing apparatus or methods adapted for special purposes not provided for in the preceding groups

CPC Search Results

G06Q10/06 — Resources, workflows, human or project management

- WO2023113653A1 (2023-06-22)
  https://patents.google.com/patent/WO2023113653A1/en
  System for managing distributed resources and projects
  Download PDF
- JP7386240B2 (2023-11-24)
  https://patents.google.com/patent/JP7386240B2/en
  automated email assistant
  Download PDF
- NL2035026B1 (2024-12-19)
  https://patents.google.com/patent/NL2035026B1/en
  Improved method for assurance score determination on data sets
  Download PDF
- BR102020009344A2 (2021-11-23)
  https://patents.google.com/patent/BR102020009344A2/en
  SYSTEM AND METHOD FOR REGISTRATION, ANALYSIS, STORAGE AND RECOVERY OF DIGITAL DATA ON THE POSITION AND TECHNICAL CONDITIONS OF INDUSTRIAL AND COMMERCIAL INSTALLATIONS
  Download PDF
- BR102021005485A2 (2022-09-27)
  https://patents.google.com/patent/BR102021005485A2/en
  SYSTEM AND METHOD FOR MANAGING THE CAPTURE OF KITCHEN OIL USED FOR CONVERSION INTO BIODIESEL
  Download PDF
- EP4639858A1 (2025-10-29)
  https://patents.google.com/patent/EP4639858A1/en
  Improved conference system and conferencing method
- BR102019019668A2 (2021-04-06)
  https://patents.google.com/patent/BR102019019668A2/en
  system and method for traceability of post-consumer solid waste
  Download PDF

G06Q30/00 — Commerce

- WO2025238629A1 (2025-11-20)
  https://patents.google.com/patent/WO2025238629A1/en
  Stochastic trading system with synthetic charting and real-time price anchoring using paired and tercet securities
- RU194645U1 (2019-12-18)
  https://patents.google.com/patent/RU194645U1/en
  DEVICE FOR DETERMINING PRODUCT AUTHENTICITY
  Download PDF"No results found for computer-vision-based smart retail shelves dynamic pricing expiration-aware inventory on Google Scholar."

Related Research

Shoppers' acceptance and perceptions of electronic shelf labels

Year - 2016 (inferred from publication info)

Source - paper

Summary - Study of how shoppers perceive and accept electronic shelf labels, including their role in enabling dynamic pricing in brick-and-mortar supermarkets.

Relevance - Directly relates to customer-facing digital price labels and dynamic pricing on shelves, which are central to the proposed smart retail shelf system.

Link - https://www.sciencedirect.com/science/article/pii/S0148296316300509

The effect of electronic shelf labels on store revenue

Year - 2020 (inferred from publication info)

Source - paper

Summary - Examines how deploying electronic shelf labels affects store revenue, likely in the context of dynamic or frequently updated pricing.

Relevance - Provides evidence and models relevant to assessing the financial impact of dynamic, shelf-level pricing that your system would implement.

Link - https://www.tandfonline.com/doi/abs/10.1080/10864415.2020.1806472

Electronic Shelf Labels: Prototype Development and Validation Using a Design Science Approach

Year - 2018 (inferred from publication info)

Source - paper

Summary - Describes the prototyping and validation of an electronic shelf label system from a technical and design perspective.

Relevance - Offers implementation-oriented prior art on ESL hardware/software integration, similar to the customer-facing digital price labels tied into your platform.

Link - https://www.researchgate.net/profile/Hyung-Sin-Kim/publication/329982499_Electronic_Shelf_Labels_Prototype_Development_and_Validation_Using_a_Design_Science_Approach/links/5c271cd2299bf12be3a00a44/Electronic-Shelf-Labels-Prototype-Development-and-Validation-Using-a-Design-Science-Approach.pdf

Technological Advancements in Pricing: A Case Study on Electronic Shelf Labels

Year - unknown

Source - paper

Summary - Case study on how electronic shelf labels enable advanced pricing strategies and real-time price updates.

Relevance - Closely aligned with dynamic, on-shelf price adjustments in response to conditions, which is a core aspect of your idea.

Link - https://osf.io/download/gdvy7/

Dynamic Pricing Strategies in Retail: A Case Study of ESL Technology Implementation

Year - unknown

Source - paper

Summary - Discusses how retailers implement dynamic pricing using ESL technology in store environments.

Relevance - Addresses algorithmic and operational aspects of dynamic pricing over ESLs that parallel your expiration- and demand-based pricing logic.

Link - https://osf.io/download/g7s59/

Streamlining Operations: The Role of Electronic Shelf Labels in Inventory Management

Year - unknown

Source - paper

Summary - Explores how ESL systems interact with inventory management processes to improve operational efficiency.

Relevance - Aligns with your integration of inventory tracking and dynamic price updates, especially how shelf systems tie into inventory automation.

Link - https://files.osf.io/v1/resources/a7vqn/providers/osfstorage/656f02bb43d067216eb19cf0?action=download&direct&version=1

A Comparative Analysis of Traditional Price Tag Systems and Electronic Shelf Labels

Year - unknown

Source - paper

Summary - Compares conventional paper tags with ESLs in terms of pricing flexibility, update frequency, and operational impact.

Relevance - Helps frame the advantages and trade-offs of customer-facing digital labels, which your smart shelf system relies on for real-time price changes.

Link - https://files.osf.io/v1/resources/tc36q/providers/osfstorage/656efdb5783ec62378eddaa3?action=download&direct&version=1

Trax Technology Solutions - Shelf Monitoring and Retail Execution

Year - unknown

Source - web

Summary - Commercial platform providing camera-based shelf monitoring, product recognition, and retail execution analytics.

Relevance - Demonstrates existing computer-vision-driven shelf inventory tracking and analytics similar to the vision component of your shelf system.

Link - https://traxretail.com

SES imagotag VUSION Shelf Edge - Electronic Shelf Labels and Computer Vision

Year - unknown

Source - web

Summary - Smart retail IoT platform combining electronic shelf labels, computer vision, and connectivity for in-store pricing and analytics.

Relevance - Very close to your concept, integrating ESLs and vision at the shelf edge and enabling dynamic pricing and data-driven shelf management.

Link - https://www.ses-imagotag.com/solutions/vusion-smart-retail-iot-platform/

Hanshow Electronic Shelf Labels and Smart Store Solutions

Year - unknown

Source - web

Summary - Vendor solution offering ESL-based smart store systems, including digital shelf labels and store-wide pricing/inventory integrations.

Relevance - Illustrates existing ESL-centered smart store architectures that your proposed system would resemble, especially regarding POS integration and real-time shelf pricing.

Link - https://www.hanshow.com/solutions/smart-store

Why These Are Relevant

- Shoppers' acceptance and perceptions of electronic shelf labels — Shoppers' acceptance and perceptions of electronic shelf labels — Directly relevant to the customer-facing electronic shelf labels and how shoppers react to dynamic, on-shelf price changes in your system.
- The effect of electronic shelf labels on store revenue — The effect of electronic shelf labels on store revenue — Provides evidence and metrics useful for evaluating dynamic pricing impacts and revenue/waste tradeoffs in grocery deployments of your idea.
- Electronic Shelf Labels: Prototype Development and Validation Using a Design Science Approach — Electronic Shelf Labels: Prototype Development and Validation Using a Design Science Approach — Offers implementation-level prior art on ESL hardware/software integration that parallels the digital price-label component of your design.
- Trax Technology Solutions - Shelf Monitoring and Retail Execution — Trax Technology Solutions - Shelf Monitoring and Retail Execution — Commercial example of camera-based shelf monitoring and analytics similar to the computer-vision inventory and demand-tracking portion of your concept.
- SES imagotag VUSION Shelf Edge - Electronic Shelf Labels and Computer Vision — SES imagotag VUSION Shelf Edge - Electronic Shelf Labels and Computer Vision — Shows an existing platform that combines ESLs and vision at the shelf edge for dynamic pricing and shelf analytics, directly aligning with your integrated ESL+CV idea.
- US11810067B2 — Digitally managed shelf space marketplace — Describes sensor-enabled computer-vision monitoring to identify products and shelf locations, which maps closely to your shelf-level vision + inventory tracking and restock suggestions.
- US20240144340A1 — Remote SKU On-Boarding of Products for Subsequent Video Identification and Sale — Covers methods for collecting image data and triggering computer-vision item detection

and product mapping, relevant to your camera-based item identification and SKU mapping flow.

- US20220358817A1 — Visual Indicator of Frictionless Status of Retail Shelves — Describes using multiple image sensors to analyze shelf/shopper status, which connects to your use of vision and traffic data to drive pricing and checkout/availability signals.
- US7940181B2 — RFID based product level availability — Describes product-level availability detection using RFID, representing an alternative sensor approach (to weight sensors/computer vision) for real-time shelf inventory that informs your multi-sensor design.
- US10387947B2 — Location assignment system and method — Covers assigning and storing item locations across store venues, which is relevant to your planogram/location-mapping, POS integration, and accurate on-shelf pricing updates.

Scoring Rationale

- Patent risk is weighted highest (40%) because freedom-to-operate and infringement exposure directly determine whether to file, build, or abandon in a crowded retail-tech field with active commercial players and recent patents.
- Technical novelty (30%) is weighted to reflect that new technical integration can create defensible value but is insufficient if patent claims block core functionality.
- Market uniqueness (30%) is weighted separately because commercial differentiation (ease of integration with POS/ESL, accuracy, cost) drives adoption and revenue even when technical novelty is modest.
- Go/no-go tie: a low freedom-to-operate result (high patent risk) should push toward "do not file / pivot" unless technical elements can be designed around or kept as trade secrets.

Novelty Scores

Technical Novelty (30%)

- Raw Score: 60
- Weighted: 60 × 0.30 = 18.0
- Explanation: The idea is a recombination of established building blocks — weight sensors, computer vision SKU detection (see US20240144340A1 and US11810067B2), electronic shelf labels, and dynamic-pricing algorithms — so the technical novelty is moderate (novel integration and edge-fusion work remains). The primary overlap is with vision/SKU-onboarding systems (US20240144340A1) and Grabango/Grabango-like CV shelf solutions (US11810067B2), making the contribution a systems-level recombination rather than a wholly new approach.

Market Uniqueness (30%)

- Raw Score: 50
- Weighted: 50 × 0.30 = 15.0
- Explanation: Market differentiation is moderate because established vendors (SES imagotag, Pricer, Hanshow, Trax, and niche players like Wasteless) already combine ESLs and pricing/analytics; specific uniqueness depends on execution (better weight+CV fusion, superior expiration-aware pricing, low-cost installs). US10387947B2 and US11176602B2 demonstrate existing commercial positioning for location assignment and in-aisle interactive systems, indicating crowded market channels and incremental differentiation risk.

Patent Risk (40%)

- Raw Score: 25
- Weighted: 25 × 0.40 = 10.0
- Explanation: High patent risk driven by multiple overlapping CPC/keyword patents and active commercial products: CPC search items (e.g., WO2023113653A1 "System for managing distributed resources and projects" and WO2025238629A1 "Stochastic trading system with synthetic charting

and real-time price anchoring …") cover workflow/resource management and algorithmic pricing design patterns that map onto your restocking/pricing logic; keyword patents such as US11810067B2 ("Digitally managed shelf space marketplace") and US20240144340A1 ("Remote SKU On-Boarding…") directly claim sensor-enabled shelf monitoring, CV-based SKU ID, and shelf marketplace/analytics flows. Likelihood of claim overlap is high for shelf-level CV+ESL integrations and for dynamic pricing decision logic; patent risk is the primary constraint on filing or commercial rollout.

Final Score

- Score: 43.0
- Overall Summary: The score is driven down primarily by patent risk (many recent CPC and keyword filings that cover shelf-level sensor fusion, CV SKU identification, ESL-managed pricing and analytics). Technically the system is a practical recombination of known modules (weight sensors, CV, ESLs, POS integration), which leaves moderate novelty but limited freedom-to-operate without design-arounds or focused claim differentiators.

Key Driver: Existing patents and active commercial platforms covering ESL + computer-vision shelf monitoring and pricing (notably US11810067B2 and the CPC-listed WO2023113653A1) create the largest constraint on filing and deployment.

Improvement Ideas

Automated FIFO shelf mechanics — Add low-profile motorized pushers or tilt-platform modules that automatically nudge older items forward (or rotate product trays) when sensors detect newer stock; this tangible automation enforces proper shelf rotation, increases on-shelf freshness, and reduces waste independent of price changes.

Per-item freshness sensing (chemical + microclimate) — Integrate small ethylene/VOC sensors plus temperature/humidity micro-sensors at shelf segments and fuse those signals with your CV/weight stream to predict actual spoilage probability per SKU-batch; concrete impact: enables earlier, more accurate markdowns and targeted removal recommendations based on biological freshness rather than just printed expiration dates.

Secondary-market routing and shared-savings revenue model — Build an automated marketplace API that offers near-expiry inventory in small lots to local businesses (cafés, restaurants, food banks) via micro-auctions or fixed-price bundles, and charge a commission or implement a shared-savings fee (e.g., percentage of waste-reduction); impact: creates a new revenue stream while materially reducing store waste liabilities.

Edge-first privacy + federated learning for multi-store models — Move inference to shelf-edge devices and implement federated learning so stores train local freshness/levelling/pricing models without centralizing raw video; concrete action: deploy optimized ONNX/TensorRT models on edge boxes and a federated update pipeline — this reduces latency, improves privacy acceptance, and produces continually improving models across your customer base.

Low-cost retrofit kit and tiered subscription targeting independents — Design a plug-and-play hardware kit (battery-backed weight strips, clip-on ESL modules, a camera-lite sensor) plus a simplified SaaS tier for small grocers and c-stores with limited IT; concrete outcome: opens an underserved market segment, accelerates adoption, and creates upsell paths to full-store integrations for larger customers.

Final Thoughts

- **Assessment**: The idea is a meaningful systems-level integration (weight sensors + computer vision + ESLs + dynamic pricing) with moderate technical novelty, but recent patents and active commercial offerings (shelf CV, ESL-driven pricing, SKU onboarding) create significant overlap and constrain freedom-to-operate.
- **Recommendation**: Proceed with prototype and targeted pilots, but delay broad commercialization and patent filing until a focused freedom-to-operate (FTO) review and claim-differentiation strategy are completed; prioritize design-arounds, trade-secret protection for algorithms, and strategic ESL/POS partnerships or licensing where needed.

- **Next Steps**:
- Commission an IP engagement: targeted FTO/claim-chart with patent counsel concentrating on recent patents (e.g., US11810067B2, US20240144340A1, US20220358817A1) and identify required design-arounds or licensing targets.
- Build a limited pilot/prototype (sensor-fusion + expiration-aware pricing + ESL integration via partner APIs) to validate technical differentiation, collect data for algorithmic improvements, and inform IP/ patent strategy.
- **Confidence**: Medium

Educational Appendix

This section provides general information about the U.S. patent process. It does not constitute legal advice.

The U.S. patent process is well documented, but difficult to navigate without context. For first-time inventors, the challenge is not understanding the rules - it is knowing **what decisions to make, and when**.

This paper explains the patent process in simple terms, highlights the points where inventors commonly make costly mistakes, and shows how Patntr.ai supports informed decision-making **before formal filing begins**.

1. What a Patent Actually Is (and Is Not)

A patent is a legal right that allows an inventor to exclude others from making, using, offering for sale, selling, or importing an invention for a limited period of time [1].

Critically:

- A patent protects **specific technical claims**, not general ideas [2]
- Two products can appear similar but have very different patent positions
- Small differences in claim wording can determine approval or rejection

Patent examiners do not evaluate ideas holistically. They evaluate **claims**, line by line, against existing public knowledge. This distinction is the source of much early confusion for first-time inventors [3].

2. The Core Patent Requirements (In Simple Terms)

For an invention to be patentable under U.S. law, it must meet three statutory requirements:

Novelty

The invention cannot already be publicly disclosed [4].

Public disclosure includes:

- Issued patents and published patent applications
- Academic or technical publications
- Public documentation, demonstrations, or product releases

Non-Obviousness

The invention cannot be an obvious modification of existing work, even if it is not identically disclosed [5].

Utility

The invention must have a specific, substantial, and credible practical use [6].

Novelty is evaluated first - and a significant portion of applications fail at this stage [7].

3. Why “Is My Idea Already Patented?” Is the Wrong Question

A common early question is:

The better question is:

Patent examiners do not reject entire ideas. They reject **claims** that overlap with prior art.

As a result, an invention may be:

- Partially known
- Incrementally different
- Patentable only in a narrower or more specific form

Understanding this distinction early often determines whether an application should be filed at all - and if so, how narrowly it must be drafted.

4. Prior Art: The Foundation of Every Patent Decision

What Is Prior Art?

Prior art is any publicly available information that is relevant to an invention’s technical concepts [8]. This includes:

- Patents and published patent applications
- Technical papers, standards, and manuals
- Public disclosures and documentation

Patent examiners rely on prior art to evaluate novelty and non-obviousness during examination [9].

If an inventor does not understand the relevant prior art **before filing**, it will surface later - often during examination - when revisions are limited and costs are higher [10].

5. Where Most Inventors Go Wrong (Early)

Without early analysis, inventors often:

- File applications that are too broad
- Miss key overlapping patents
- Spend heavily before understanding patentability risk
- Discover fatal issues only after filing

These problems typically surface during examination, when options are constrained and sunk costs are high.

The highest leverage point in the patent process is **before drafting begins**.

6. The Patent Process - Reframed as Decisions

The USPTO describes the patent process in five formal stages [11].
In practice, inventors face **three critical decision points**.

Decision Point 1: Before Filing Anything

(USPTO: “Get ready to apply”)

At this stage, inventors must determine:

- Whether similar inventions already exist
- Which features may already be publicly disclosed
- Whether the invention is likely patentable only in a narrow form

This is where Patntr.ai fits.

Patntr.ai is designed to operate **before formal patent drafting**. It helps inventors:

- Understand the existing patent landscape
- Identify overlap and differentiation
- Decide whether and how to proceed

Possible outcomes:

- Proceed to attorney drafting
- Revise or refine the invention
- Pause or abandon early (often the correct decision)

Decision Point 2: Filing Strategy

(USPTO: “File your application”)

Once filing begins, inventors must choose:

- Provisional vs nonprovisional filing
- Claim scope and technical emphasis
- Whether international protection may be required

After filing, **new technical material cannot be added** to an application [12].

While Patntr.ai does not file applications, its analysis:

- Helps scope claims more realistically
- Reduces trial-and-error during drafting
- Improves communication with patent counsel

Decision Point 3: Examination and Prosecution

(USPTO: “Application prosecution”)

Rejections are common and expected. Examiners conduct independent searches and apply statutory standards for:

- Novelty (35 U.S.C. §102)
- Non-obviousness (35 U.S.C. §103)
- Written description, enablement, and clarity (35 U.S.C. §112)

Most prosecution outcomes are shaped by **how well novelty and overlap were understood before filing**.

7. Step-by-Step: Using Patntr.ai

Step 1: Describe the Invention

Users describe their idea in plain language, including:

- The problem being solved
- How the solution works
- Key components or features
- Intended use

No legal or technical formatting is required.
Submissions are private by default.

Step 2: Technical Interpretation

Patntr.ai translates descriptions into:

- Technical concepts
- Functional components
- Patent-relevant abstractions

This mirrors how patent examiners abstract inventions for comparison during examination.

Step 3: Prior Art Comparison

The system compares interpreted concepts against:

- Global patent databases
- Published technical and scientific references

It identifies:

- Closest prior art
- Areas of overlap
- Potential points of differentiation

All sources are linked and cited.

Step 4: Novelty Scoring and Explanation

Each report includes:

- A 0–100 novelty score
- A written explanation grounded in cited references
- Clear context on whether the score indicates strong differentiation or likely refinement work

The score reflects:

- Degree of differentiation
- Density of similar filings
- Risk if filed without modification

The explanation is designed to be understandable without legal training.

Step 5: Practical Recommendations

Rather than a binary result, reports include:

- Suggestions for narrowing scope
- Potential adjustments to improve novelty
- Areas that may require careful claim drafting

These insights help guide next steps.

Step 6: Structured Report Delivery

Results are delivered as a PDF suitable for:

- Personal evaluation
- Sharing with collaborators
- Attorney consultation
- Investor discussions

The report is structured to support downstream decision-making.

8. Working With a Patent Attorney Afterward

With a novelty report in hand, inventors are better positioned to:

- Ask informed questions
- Focus legal effort on viable paths
- Reduce exploratory legal costs

Patent attorneys still perform:

- Formal searches
- Claim drafting
- Filing and prosecution

Patntr.ai ensures those steps are taken with context [13].

9. What Patntr.ai Is - and Is Not

Patntr.ai is:

- An early-stage analysis tool
- A decision-support system
- A way to understand patent risk sooner

Patntr.ai is not:

- A legal authority
- A replacement for counsel
- A guarantee of patent approval

10. Why Early Understanding Matters

Patent outcomes are shaped long before filing.

Inventors who understand:

- The landscape
- The overlaps
- The risks

are better equipped to:

- Improve their ideas
- Allocate resources wisely
- Decide whether to proceed at all

Patntr.ai is designed to support that understanding.

Conclusion

The patent system is complex, procedural, and difficult to navigate without context.
Patntr.ai makes the earliest stages more transparent - so inventors can make informed decisions **before** committing time, money, and effort.

Patntr.ai

Sources & References

- 35 U.S.C. §154 - Contents and term of patent
- USPTO – Patent Claims Basics
- Manual of Patent Examining Procedure (MPEP) § 904 - Examination of claims
- 35 U.S.C. §102 - Conditions for patentability; novelty
- 35 U.S.C. §103 - Conditions for patentability; non-obvious subject matter
- 35 U.S.C. §101 - Inventions patentable (utility requirement)
- USPTO Patent Examination Statistics - Data Visualization Center
- MPEP § 2121 - Definition of prior art
- USPTO – Prior Art and Patent Examination
- USPTO – Patent Process Overview
- USPTO – Patent Process: Five Stages
- MPEP § 2163 - Written description requirement
- USPTO – Using Legal Services (Attorneys and Agents)