

**REVISED PROVISIONAL PATENT APPLICATION
LANGUAGE**

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Caffevolve Automated Coffee Brewing System

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APPLICANT INFORMATION

Invention Name:

Caffevolve Automated Coffee Brewing System with Customizable Caffeine Control, Pharmaceutical-Grade In-Stream Additive Dispensing, and Daily-Fresh Water Optimization

Inventor:

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Application Type:

Utility Patent (Provisional)

Technology Class:

Primary: A47J 31/00 (Apparatus for making beverages)

Secondary: A23F 5/00 (Coffee; Coffee substitutes)

BACKGROUND

This provisional patent application describes the Caffevolve automated coffee brewing system, which addresses limitations of conventional coffee makers through integrated innovations in caffeine customization, pharmaceutical-grade supplement dispensing, and water quality optimization.

The system executes a seven-phase brewing process: (1) user input and system configuration with saved profiles, (2) dual-hopper proportional bean dispensing with gravimetric precision, (3) active mechanical bean blending via reciprocating agitator arm, (4) precision grinding for particle-level homogeneity, (5) multi-phase drip brewing extraction with PID temperature control, (6) in-stream pharmaceutical-grade powder additive dispensing during the brewing process, and (7) final delivery with automatic system reset. This integrated approach enables precise caffeine control (0-100%), pharmaceutical-grade supplement delivery, and intentionally right-sized water reservoirs that encourage daily freshness for optimal flavor.

DETAILED DESCRIPTION

Phase 1: User Input & System Configuration

Users select desired caffeine percentage (0-100%), cup size (8-40 oz scalable, 8-60 oz on commercial models), brew strength, powder additives, and grind size via touchscreen (Advancara/Culminara) or rotary dial with digital display (Originara). The microprocessor calculates exact bean proportions and total bean mass based on selected parameters.

User Profile & Preset System:

All models support user profiles with saved presets capturing complete brewing configurations (caffeine percentage, cup size, brew strength, additive selections with dosages, grind size, and user-assigned labels). Profile capacity scales by tier: Originara (2 profiles, 3 presets each), Advancara (5 profiles, 5 presets each), Culminara (20 profiles, 10 presets each for commercial environments). One-touch brewing eliminates repetitive configuration.

Phase 2: Dual-Hopper Proportional Bean Dispensing

Bean Storage & Hopper System:

Separate hoppers for regular caffeinated beans (Hopper A) and decaffeinated beans (Hopper B) with UV-protective opaque construction, one-way valve moisture prevention, and load cell monitoring. Capacity scales by model: Originara (250g each), Advancara (500-750g each), Culminara (1,000g each).

Gravimetric Dispensing Mechanism (All Models):

Each hopper is mounted on an individual load cell platform providing $\pm 0.1g$ accuracy. The system employs gate valve mechanisms (electromechanical servo-actuated) positioned at the base of each hopper. Upon brew initiation, the microprocessor calculates target masses for both hoppers based on user-selected caffeine percentage and total coffee volume.

Dispensing Process:

1. Gate Opening: Both gate valves open simultaneously
2. Gravity Flow: Beans flow by gravity into the blending chamber below
3. Real-Time Monitoring: Load cells continuously measure hopper weight
4. Precision Cutoff: When target mass is reached ($\pm 0.1g$), gate valve closes
5. Verification: System confirms both hoppers dispensed correct amounts

Example:

For 60% caffeine, 12oz cup (18g total beans required):

- Hopper A target: 10.8g ($60\% \times 18g$)
- Hopper B target: 7.2g ($40\% \times 18g$)

- System monitors: Hopper A reads 240.0g → 239.0g → 238.0g → 237.5g → 237.2g → STOP at 10.8g dispensed
- System monitors: Hopper B reads 240.0g → 239.5g → 238.5g → 237.8g → STOP at 7.2g dispensed
- Blend accuracy: $\pm 1\%$ of target ratio

Advantages of Gravimetric Method:

- Superior Accuracy: Weight-based measurement eliminates volumetric variation from bean size differences
- Simplicity: Fewer moving parts than auger systems (no motors, no auger wear)
- Cost-Effectiveness: Load cells and gate valves cost less than stepper motor/auger assemblies
- Reliability: Minimal mechanical complexity reduces failure points
- Universal Applicability: Works identically regardless of bean origin, roast level, or age
- Self-Calibrating: Electronic zeroing requires no physical adjustment

Pre-Grind Blending Chamber:

Funnel-shaped chamber with 45-60° cone angle (capacity 25-40g) ensures complete drainage. Anti-static interior coating prevents bean adhesion. Transparent window (some models) allows visual confirmation. Chamber outlet positioned directly above grinder inlet for zero-retention direct feed architecture.

Phase 3: Active Bean Blending

After proportional bean dispensing, the system executes a critical active blending phase ensuring particle-level homogeneity essential for precise caffeine customization. This mechanical blending process is identical across all three product tiers.

Reciprocating Agitator Arm System:

A stepper motor-driven agitator arm sweeps through the blending chamber in a controlled 180° arc pattern, completing 5-6 full sweep cycles over 2-3 seconds. This active mechanical action creates thorough integration of regular and decaf beans impossible with passive tumbling alone. The standardized mechanism (identical across Originara, Advancara, and Culminara) provides consistent blend accuracy ($\pm 1\%$) across all price points through precise rotation count control and optimized arc geometry.

Upon completion, the agitator arm returns to home position, and the gravity-fed chamber immediately releases the homogeneous blend directly into the grinder below. Zero retention design ensures no cross-contamination between different caffeine blend ratios.

Phase 4: Precision Grinding

Grinder Integration & Specifications:

Conical burrs (40-50mm) or flat burrs (58-83mm) in hardened steel or ceramic, positioned directly beneath blending chamber for zero-retention design. Grind execution varies by size: fine grind (400-600 RPM, 20-25 seconds), medium grind (800-1000 RPM, 12-15 seconds), coarse grind (1200-1400 RPM, 8-10 seconds).

Critical Blend Homogenization During Grinding:

The 8-25 second grinding process provides final mixing stage. Regular and decaf beans (already proportionally blended) pass through burrs together. Both bean types fracture identically due to same cellular structure and hardness. Resulting grounds are particle-level homogeneous, impossible to visually or mechanically separate regular from decaf particles. Grounds fall directly into drip basket through static-reducing chute.

Phase 5: Drip Brewing Extraction

Water Heating System:

System varies by model: Originara (instant heating coil, single-pass exchanger, 1000W), Advancara (thermoblock, on-demand heating with 30-45 second heat-up, 1400W), Culminara (boiler reservoir system maintaining constant 200°F ready temperature, 1800W). PID controller maintains $\pm 2^\circ\text{F}$ precision throughout brew cycle. Pre-infusion temperature: 200-204°F. Brewing temperature: 195-205°F optimized for extraction.

Multi-Phase Brewing Process:

Phase 1 - Bloom (30-45 seconds): Initial water pulse delivers 30% of total brew water through 5-9 spray holes in circular shower head pattern ensuring even saturation. Wets all grounds, releases trapped CO_2 gas. Pause allows degassing to complete.

Phase 2 - First Extraction (60-90 seconds): Second water pulse delivers 40% of total brew water. Begins extracting coffee solubles at flow rate 1.5-2.0 oz/minute. Coffee begins dripping into carafe or cup.

Phase 3 - Second Extraction (60-90 seconds): Final water pulse delivers remaining 30% of water, completing extraction cycle while maintaining consistent temperature and flow.

Phase 4 - Drawdown (30-60 seconds): No new water added. Remaining liquid drains through coffee bed for final extraction of solubles. Drip rate gradually slows to completion.

Total Brew Time:

8oz cup: 3.5-4 minutes | 12oz cup: 4-5 minutes | 16oz cup: 5-6 minutes | Full carafe (60oz): 8-10 minutes

Extraction Chemistry & Uniformity:

Custom caffeine blends extract uniformly because: (1) Regular and decaf beans are chemically identical except for caffeine content, (2) Identical cellular structure means identical extraction rates, (3) Particle size distribution is uniform (same grind for both bean types), (4) Molecular-level integration prevents stratification, (5) No possibility for lighter/heavier particles to separate during brewing. Target extraction: TDS 1.15-1.35%, extraction yield 18-22% of coffee mass, optimal flavor balance achieved regardless of caffeine percentage.

Phase 6: In-Stream Powder Additive Dispensing

Timing & Trigger System:

Additive dispensing begins during the active brewing cycle when coffee volume reaches approximately 30-50% of target (typically during the First Extraction phase). This timing ensures additives integrate into the flowing coffee stream rather than being deposited onto finished coffee. The system monitors brew progress and triggers dispensing at the optimal moment for maximum integration.

Modular Cartridge Architecture:

User-fillable cartridge chambers scale by model: Originara (6 chambers), Advancara (8 chambers), Culminara (12 chambers). Each chamber is user-fillable with pharmaceutical-grade powder additives from preferred suppliers. Refillable design provides flexibility and cost control. Touchscreen interface (Advancara/Culminara) or dial selection (Originara) allows users to assign additive types to each chamber position. System tracks additive name, approximate fill level based on dispensing history, and user-set refill alerts.

Environmental Protection:

Desiccant packets in all powder cartridge slots maintain dryness. UV-protective housing prevents photodegradation. Airtight seals preserve potency and prevent clumping. Climate-controlled storage (Culminara) maintains optimal 60-70°F, <50% humidity.

Pharmaceutical-Grade Micro-Auger Dispensing:

Precision screw conveyor in sealed chamber with auger specifications: 0.5-1.0mm pitch for fine powder control, 3-5mm diameter depending on powder characteristics, food-grade stainless steel or FDA-approved polymer construction. Stepper motor control with micro-stepping for ultra-precise rotation. Each auger dedicated to single cartridge (no cross-contamination).

Dual Load Cell Verification System:

Primary measurement: Cartridge sits on load cell platform. Secondary verification: Receiving chamber also on load cell. Both sensors confirm exact dosage dispensed.

Example: 300mg Ashwagandha Powder

- Pre-dispense weight: Cartridge reads 45.800g
- Auger activation: Stepper motor begins controlled rotation
- Real-time monitoring: 45.750g (50mg), 45.650g (150mg), 45.550g (250mg), 45.500g (300mg)—STOP
- Verification: Receiving chamber confirms 0.300g received
- Accuracy: $\pm 5\text{mg}$ ($\pm 1.7\%$ for this dose)

Powder Delivery Method - In-Stream Integration:

Powder dispenses through precision funnel positioned to intersect the flowing coffee stream as it drips from the brew basket into the carafe or cup. The additive delivery nozzle is positioned 6-8 inches above the carafe rim, allowing powder to drop into the falling coffee stream. Anti-static coating on funnel prevents powder adhesion. Vibration assist (if needed): brief 0.5-second pulse dislodges sticky powders.

Critical Advantage:

By dispensing into the flowing stream during brewing (rather than onto finished coffee), additives achieve superior integration through natural turbulence and the kinetic energy of the falling liquid.

Integration & Mixing Systems:

Method 1 - Flow Dynamics Integration (Primary): The falling coffee stream creates natural turbulence as it enters the carafe. Powder dispensed into this stream is carried downward and distributed throughout the liquid. The 6-8 inch drop height generates sufficient kinetic energy for initial mixing.

Method 2 - Baffled Carafe Design (Passive Assist): Carafe features internal spiral baffles or flow-directing geometry creating turbulent mixing zones. Coffee follows helical path promoting uniform distribution. Three-level helical baffle system (Advancara/Culminara) ensures complete integration during 4-5 minute brew cycle.

Method 3 - Post-Brew Vibration (Optional): After brewing completes, optional vibration motor activates for 5-15 seconds. Low-frequency vibration (50-100Hz) ensures residual powder particles fully dissolve. Particularly effective for cohesive powders like protein or collagen.

Method 4 - Ultrasonic Mixing (Culminara Premium Feature): 40kHz ultrasonic pulse (beyond human hearing) for 2-3 seconds post-brewing. Low intensity avoids heating or flavor alteration. Cavitation bubbles create micro-turbulence at particle surfaces. Dramatically accelerates dissolution of collagen peptides, protein powders, and fibrous botanical extracts. Improved bioavailability through smaller particle dispersion.

Phase 7: Final Delivery & System Reset

Beverage Completion:

Final beverage delivered at optimal drinking temperature: 160-170°F. Glass carafe models: warming plate maintains temperature. Thermal carafe models: vacuum insulation retains heat for 2-4 hours without power. Single-cup brewing: coffee ready immediately in user's mug. Quality confirmation: No powder residue visible on surface, completely homogeneous appearance, additives blend seamlessly. User notification: Audible chime signals brew completion. Display shows customization details (e.g., 'Your 12oz, 60% caffeine + 100mg L-theanine coffee is ready'). LED indicator confirms all cycles completed successfully.

Automatic Cleaning & Purge Cycle:

Step 1 - Additive Pathway Purge: Brief air pulse (1-2 seconds) through each dispensing funnel clears residual powder from auger chamber and delivery tube. Prevents cross-contamination between different additives. Residue directed to drip tray.

Step 2 - Grinder Chamber Purge: Brief burst of air or mechanical sweep clears residual grounds. Ensures zero coffee retention between different caffeine blends. Critical for accurate customization on subsequent brews.

Step 3 - System Diagnostics: Self-check of all sensors and mechanisms. Load cells re-zero for next dispensing cycle. Confirms all cartridges properly seated.

Step 4 - System Ready State: All components return to standby. Display shows: 'Ready for next brew'. Status check: Hoppers, cartridges, water reservoir levels. User alerted if any refills needed.

Total Process Time Summary:

Single 12oz cup: 5-7 minutes (blend, grind, brew with in-stream additives, optional vibration)

Full 60oz carafe: 10-12 minutes

Detailed breakdown: Bean dispensing & blending (15 seconds), Grinding (12-20 seconds), Brewing with in-stream additive dispensing (4-5 minutes single / 8-10 minutes carafe), Additive dispensing duration (3-5 seconds, occurs during brewing), Optional post-brew vibration (5-15 seconds), Purge & reset (5 seconds)

Daily-Fresh Water Reservoir System

The Caffevolve system incorporates a right-sized water reservoir specifically designed to optimize water freshness for same-day consumption, thereby enhancing coffee flavor quality while maintaining user convenience. Reservoir capacity is scaled by model to support the full range of scalable brewing (8-40 oz on consumer models, 8-60 oz + custom on commercial).

Key Design Features:

1. Optimized Capacity by Model:

Reservoir capacity is sized to support scalable brewing while encouraging daily water replacement:

- Originara (\$199): 40-50 oz reservoir - supports 8-40 oz scalable brewing
- Advancara (\$599): 50-60 oz reservoir - supports 8-40 oz scalable brewing with margin
- Culminara (\$2,499+ COMMERCIAL): 80-96 oz reservoir - supports 60 oz carafe capacity plus custom sizes

2. Daily Refresh Philosophy:

The reservoir capacity is intentionally calibrated to encourage daily water replacement, ensuring that water used for brewing is consistently fresh (less than 24 hours old).

3. Visual User Guidance:

The reservoir includes clearly marked capacity indicators:

- Graduated markings for brew sizes (8, 12, 16, 20, 40 oz)
- Fill lines corresponding to number of brews
- Optional time-since-fill indicator on control interface

4. Removable Design:

The reservoir features tool-free removal for easy daily cleaning and refilling, encouraging healthy maintenance habits and reducing bacterial growth.

5. Water Quality Optimization Window:

The system is specifically designed for a 24-hour water quality window, after which water quality begins to degrade due to:

- Loss of dissolved oxygen content (affecting flavor extraction)
- Potential bacterial growth (health and taste concerns)
- Temperature equilibration with ambient conditions (affecting heating efficiency)
- Accumulation of off-flavors from prolonged exposure to reservoir materials

6. Material Specifications:

- Construction: BPA-free, food-grade polymer (Tritan copolyester or equivalent)
- Antimicrobial coating: Silver-ion or copper-ion embedded surface treatment
- Transparency: Clear or translucent design for visual water level verification
- Insulation: Optional double-wall construction to maintain water temperature

7. Sensor Integration:

- Water level sensor (capacitive or optical) for pre-brew verification
- Low-water alert system prevents brewing with insufficient water
- Optional: Time-since-fill tracking via control system timestamp
- Optional: Water quality sensors (dissolved oxygen, temperature, conductivity)

FUNCTIONAL ADVANTAGES OVER PRIOR ART

Unlike conventional coffee makers that use large reservoirs requiring refilling only every few days:

Superior Flavor Quality:

- Dissolved Oxygen Preservation: Water refreshed daily maintains higher dissolved oxygen levels (typically 8-10 mg/L in fresh tap water vs. 4-6 mg/L after 48 hours of storage)
- Elimination of Stale Water Taste: Daily water replacement prevents the development of off-flavors
- Temperature Consistency: Fresh cold water provides consistent starting temperatures (50-60°F)
- Mineral Stability: Fresh water maintains consistent mineral content and pH for optimal extraction

Health and Safety Benefits:

- Bacterial Growth Prevention: Daily refresh cycle minimizes time window for bacterial colonization
- Biofilm Reduction: Shorter exposure time reduces biofilm formation on reservoir surfaces
- Reduced Cleaning Chemical Exposure: More frequent water changes mean less need for aggressive descaling

Blend-Then-Grind Caffeine Control Advantages:

- Particle-Level Homogeneity: Impossible to achieve with pre-ground mixing. Regular and decaf beans ground together ensures molecular-level integration.
- Precise Ratio Control: Gravimetric dispensing provides $\pm 1\%$ blend accuracy across 0-100% caffeine range
- Maximum Freshness: Grind-on-demand for each custom blend preserves volatile aromatics and flavor compounds

In-Stream Additive Dispensing Advantages:

- Superior Integration: Dispensing into flowing coffee stream during brewing leverages natural turbulence and kinetic energy for thorough mixing
- Pharmaceutical-Grade Precision: Dual load cell verification system provides $\pm 5\text{mg}$ accuracy for supplement dosing
- Enhanced Bioavailability: Powder particles suspended in hot liquid during brewing process improves dissolution compared to post-brew mixing

PRODUCT TIER SPECIFICATIONS

The Caffevolve system is designed for scalable manufacturing across three distinct product tiers, enabling broad market coverage while maintaining core patent protection:

ORIGINARA (\$199 - Entry Consumer Model)

- Bean Hoppers: 250g capacity each (regular and decaf)
- Bean Dispensing: Gravimetric (load cell + gate valve)
- Water Reservoir: 40-50 oz (1.2-1.5L)
- Carafe: Glass carafe with warming plate
- Additive System: 6 user-fillable cartridge chambers | Pharmaceutical-grade micro-auger dispensing
- User Profiles: 2 profiles, 3 saved presets per user
- Caffeine Control: 0-100% in user-selected increments
- Grind Settings: Fine/Medium/Coarse for drip brewing
- Interface: Rotary dial with digital display

ADVANCARA (\$599 - Premium Home Model)

- Bean Hoppers: Capacity scaled above Originara (500-750g each)
- Bean Dispensing: Gravimetric (load cell + gate valve)
- Water Reservoir: 50-60 oz (1.5-1.8L)
- Carafe: Customer choice at purchase: Glass carafe OR thermal carafe
- Additive System: 8 user-fillable cartridge chambers | Pharmaceutical-grade micro-auger dispensing
- User Profiles: 5 profiles, 5 saved presets per user
- Caffeine Control: 0-100% in 1% increments (continuous control)
- Grind Settings: Fine/Medium/Coarse for drip brewing
- Interface: Touchscreen interface

CULMINARA (\$2,499+ - Commercial/Professional Model)

COMMERCIAL USE ONLY: Designed for cafes, offices, hospitality venues

- Bean Hoppers: 1,000g capacity each (regular and decaf)
- Bean Dispensing: Gravimetric (load cell + gate valve)
- Water Reservoir: 80-96 oz (2.4-2.8L)
- Carafe: Thermal/vacuum carafe only (commercial durability, no power consumption)
- Additive System: 12 user-fillable cartridge chambers | Pharmaceutical-grade micro-auger dispensing
- User Profiles: 20 profiles, 10 saved presets per user
- Caffeine Control: 0-100% in 0.1% precision increments
- Grind Settings: Fine/Medium/Coarse for drip brewing
- Interface: Touchscreen interface

PROPOSED PATENT CLAIMS

Independent Claim 1:

A coffee brewing apparatus comprising: a dual-hopper bean storage system for proportional blending of caffeinated and decaffeinated beans using gravimetric dispensing with individual load cell platforms and gate valve mechanisms; a reciprocating agitator arm system that sweeps through a blending chamber in a controlled arc pattern to actively blend dispensed beans before grinding; a burr grinding system positioned directly beneath said blending chamber; a brewing chamber with multi-phase water delivery; an additive dispensing system with user-fillable cartridge chambers and pharmaceutical-grade micro-auger mechanisms with dual load cell verification, wherein additives dispense into the flowing coffee stream during active brewing; and a daily-fresh water reservoir system; wherein the water reservoir capacity is intentionally sized to encourage daily water replacement for optimizing water freshness parameters including dissolved oxygen content, bacterial growth prevention, and temperature consistency.

Dependent Claims:

Claim 2: The apparatus of claim 1, wherein the reciprocating agitator arm completes 5-6 full sweep cycles through a 180° arc pattern over 2-3 seconds, driven by a stepper motor with precise rotation count control.

Claim 3: The apparatus of claim 1, wherein the additive dispensing system triggers when coffee volume reaches 30-50% of target during the First Extraction phase, dispensing powder through a precision funnel positioned 6-8 inches above the carafe to intersect the falling coffee stream.

Claim 4: The apparatus of claim 1, wherein the pharmaceutical-grade micro-auger dispensing mechanism comprises a precision screw conveyor with 0.5-1.0mm pitch, 3-5mm diameter, controlled by a stepper motor with micro-stepping capability, and verified by dual load cells providing ± 5 mg accuracy.

Claim 5: The apparatus of claim 1, wherein the multi-phase brewing process comprises: (a) bloom phase delivering 30% of total water over 30-45 seconds, (b) first extraction phase delivering 40% of total water over 60-90 seconds, (c) second extraction phase delivering 30% of total water over 60-90 seconds, and (d) drawdown phase over 30-60 seconds.

Claim 6: The apparatus of claim 1, wherein the dual-hopper gravimetric dispensing system employs individual load cell platforms (± 0.1 g accuracy) with electromechanical gate valves, wherein beans flow by gravity while real-time weight monitoring controls gate closure achieving ± 1 % blend accuracy.

Claim 7: The apparatus of claim 1, wherein the blending chamber features a funnel-shaped design with 45-60° cone angle, anti-static interior coating, and direct feed architecture with zero-retention to the grinder below.

Claim 8: The apparatus of claim 1, further comprising a user profile system storing complete brewing configurations including caffeine percentage, cup size, brew strength, additive selections with dosages, and grind size, wherein profile capacity scales by product tier.

Claim 9: The apparatus of claim 1, wherein the control system includes a water age indicator that tracks elapsed time since reservoir filling and provides user notification after 24 hours.

Claim 10: The apparatus of claim 1, wherein reservoir capacity varies by product tier: 40-50 oz for entry-level consumer models, 50-60 oz for premium home models, and 80-96 oz for commercial models.

Claim 11: The apparatus of claim 1, wherein the additive dispensing system comprises 6 cartridge chambers in entry models, 8 chambers in premium models, and 12 chambers in commercial models.

Claim 12: The apparatus of claim 1, wherein carafe configuration progresses from glass carafe with warming plate (entry model), to customer choice of glass or thermal carafe (premium model), to thermal/vacuum carafe only (commercial model).

Claim 13: The apparatus of claim 1, wherein bean hopper capacity scales by product tier: 250g each for entry consumer model, 500-750g each for premium home model, and 1,000g each for commercial model.

Claim 14: The apparatus of claim 1, further comprising a baffled carafe design with internal spiral baffles creating turbulent mixing zones for passive integration of dispensed additives.

Claim 15: The apparatus of claim 1, further comprising an automatic cleaning and purge cycle including: additive pathway purge via air pulse, grinder chamber purge, system diagnostics with load cell re-zeroing, and status verification of all components.

INVENTOR'S STATEMENT

This provisional patent application comprehensively describes the Caffevolve automated coffee brewing system conceived by the inventor. The described features represent intentional design decisions to optimize coffee quality through precise caffeine customization, pharmaceutical-grade supplement delivery, and water freshness optimization, while maintaining system scalability across consumer and commercial markets.

Inventive Step:

The features are novel, non-obvious, and provide utility by measurably improving coffee flavor quality and customization capabilities compared to conventional coffee brewing systems. The integration of seven distinct phases—proportional gravimetric bean dispensing, active mechanical blending via reciprocating agitator arm, precision grinding, multi-phase brewing with PID temperature control, in-stream additive dispensing during active brewing, pharmaceutical-grade dosing accuracy, and daily-fresh water optimization—creates a synergistic system providing benefits impossible to achieve through individual components alone.

Novelty:

No prior art identified for coffee brewing appliances that combine: (1) dual-hopper proportional bean blending using gravimetric dispensing with active mechanical agitation before grinding for precise caffeine control, (2) in-stream pharmaceutical-grade additive dispensing during the brewing process with dual load cell verification providing $\pm 5\text{mg}$ accuracy, (3) intentionally right-sized reservoirs that encourage daily water refreshing as a quality-enhancement strategy, and (4) multi-phase extraction with precise timing triggers for additive integration. The specific implementation of gravimetric bean dispensing ($\pm 0.1\text{g}$ accuracy) combined with a reciprocating agitator arm system with controlled 180° arc pattern for bean blending, combined with pharmaceutical-grade micro-auger dispensing timed to intersect the flowing coffee stream during First Extraction phase, represents a novel approach to coffee customization not found in existing patents or commercial products.

Non-Obviousness:

A skilled artisan would consider: (1) larger reservoirs advantageous for user convenience, (2) pre-ground blending adequate for caffeine control, (3) post-brew additive mixing sufficient for supplement delivery, (4) passive tumbling adequate for bean mixing, and (5) volumetric auger-based bean dispensing acceptable for proportion control. The inventive insight is recognizing that coffee enthusiasts willing to customize caffeine ratios and add supplements prioritize quality over maximum convenience, and that: (a) gravimetric dispensing provides superior accuracy at lower cost than auger systems, (b) blend-then-grind methodology with active mechanical agitation provides particle-level homogeneity impossible with pre-ground mixing, (c) in-stream dispensing during brewing leverages natural turbulence for superior integration compared to post-

brew mixing, (d) pharmaceutical-grade dual load cell verification ensures precise dosing critical for wellness supplements, (e) daily-fresh water provides measurably superior flavor through dissolved oxygen preservation and bacterial growth prevention, and (f) progressive product tier configurations enable optimal solutions across price points while maintaining unified patent protection. The specific timing of additive dispensing at 30-50% brew volume during First Extraction phase represents non-obvious optimization discovered through iterative testing, as conventional wisdom would suggest either pre-brew or post-brew mixing.

**END OF REVISED PROVISIONAL PATENT APPLICATION
LANGUAGE**

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