

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DUKE MANUFACTURING CO.,
Petitioner

v.

MARMON FOODSERVICE TECHNOLOGIES, INC.
Patent Owner.

Case IPR2026-00406
Patent 10,852,002

**DECLARATION OF DR. TIMOTHY J. BOWSER IN SUPPORT OF
PATENT OWNER'S PRELIMINARY RESPONSE**

I, Timothy J. Bowser, declare as follows:

I. Background and Qualifications

1. My name is Timothy J. Bowser, PhD, PE.
2. I am a Professor of Biosystems and Agricultural Engineering at Oklahoma State University and a licensed Professional Engineer. My CV is annexed hereto as Ex. 2007.
3. I submit this declaration in support of the Patent Owner Preliminary Response of Marmon Foodservice Technologies, Inc., IPR2026-00406, concerning U.S. Patent 10,852,002.
4. I serve as the Food Process Engineer for FoodMech, LLC. In this position, I consult in the areas of food process development, equipment selection and design, facility design and layout, product development and evaluation, troubleshooting, feasibility studies, intellectual properties, personal injury, and standards of care.
5. As the Co-owner and Principal Engineer of PetMech, LLC, I provide services to the pet and animal food industry ranging from product development and processing to product testing for digestibility, preference, acceptability, custom tests, and technical expertise.
6. I have been retained as a technical expert in several intellectual properties cases within the food industry. Cases included composition and

processing of meat analog products, pet chew formulation and processing, processing of reclaimed waste food products, processed beef products, refrigeration and freezing system design, instrumentation for dairy cattle, thin film dehydration, and a sensor used to determine oil condition in a fryer.

7. I have more than forty years of experience involving food-processing systems, food equipment design, thermal processing, heat transfer, food quality, process optimization, and commercial foodservice equipment.

8. I have worked directly with a commercial foodservice equipment manufacturer. My work included evaluation of food-holding and storage equipment, heat transfer to and from food products, temperature control, moisture retention, and food-quality changes that occur during holding.

9. Throughout my career, I have repeatedly worked on systems involving food heating, cooling, storage, thermal management, process validation, food safety, food quality, and equipment design. I hold a US Patent (6,357,681, March 19, 2002) on a size-reduction, separation device that grinds food products while simultaneously removing undesirable portions (seeds, stems, sinew, bone) and contaminants (metal, glass, hard plastic). Another patent publication (U.S. Patent Application Document US 2011/0142993 A1) describes a method to make pet and animal chews using heat and enzyme treatments. I have published

documents on food drying, lethality treatments for meat, steam use in food processing, sanitary design, cleaning systems, and related applications.

10. My work in industry and academia has included numerous studies and applications of food sensory analysis, and food safety and quality. This includes sensory panels, food texture analysis, measurement of physical properties of food, cross-contamination assessments, microbiological evaluations, thermal treatments, lethality assessment, shelf-life studies, color change in foods, enzyme addition and enzymatic reactions, oxidation of foods, moisture migration, pH assessment, head space analysis, particle size, viscosity, cleaning and sanitation, materials selection, sanitary design, and other areas.

11. In my experience, the existence of multiple design alternatives does not by itself establish that the resulting performance outcomes were predictable. Engineers routinely evaluate apparently reasonable alternatives because food-holding performance may depend on multiple interacting variables whose relative significance cannot always be determined before testing and validation are performed.

12. The opinions expressed herein are based on my education, training, professional experience, and review of the materials identified below.

II. Person Having Ordinary Skill in the Art (“PHOSITA”)

13. I have reviewed the declaration of Glenn Vallee, Ex. 1003, submitted by petitioner Duke Manufacturing Co. in support of its Petition for Inter Partes Review. Dr. Vallee states that a person having ordinary skill in the art would have an engineering degree and/or approximately four years of experience involving the design or manufacture of foodservice equipment and may work as part of a multidisciplinary team. I believe that description is incomplete. Dr. Vallee’s description of a PHOSITA does not include reasonable consideration of the food component, which is the object of the storage system, and industry standards. A person who has ordinary skill in the art would necessarily possess expertise in food sensory analysis, food safety, food quality, and applicable industry standards. These additional skills are essential for the following reasons.

a. Food Sensory analysis and Food Quality measurement skills are required to understand, evaluate, and apply claimed properties of the stored food products. Ex. 2008; Ex. 2009. Claimed properties of the food include “just cooked” peak flavor, sealed in flavors and moisture, texture maintained 66% longer than conventional holding methods, crispiness, moisture control, and maximized quality. Assessment of other properties requiring skills in Food Sensory and Quality testing are required. Ex. 2010. Example properties include appearance, shape, structure, flavor, aroma, shear force, hardness,

chewiness, gumminess, water activity, color change, identification of ingredients and contaminants, presence and type of microorganisms, and pH. Further skills are required to organize and operate sensory panels and instruments and to interpret results. Food Quality and Sensory skills are necessary to provide better experiences for consumers and more profit and less waste for the user. Ex. 2008.

b. Experience with applicable industry standards is required to design and manufacture food holding equipment to ensure product safety, regulatory compliance, cleanability, and overall performance. Ex. 2011.

c. A Food Safety background is essential to assess and manage issues related to storage, spoilage mechanisms, growth of microorganisms, and the impact of stored food on the health and wellbeing of consumer. Ex. 2012.

14. A more complete description of a PHOSITA in this case would include not only education or experience relating to the design or manufacture of foodservice equipment, but also sufficient knowledge of food quality, food safety, sensory analysis, and applicable industry standards to evaluate whether a food-holding system achieves its intended objectives. In my opinion, a person responsible for designing and evaluating commercial food-holding equipment

would necessarily consider both the performance of the equipment and the performance of the food product being held.

15. In my experience, individuals operating at the revised level described above, routinely evaluate commercial food-holding systems based upon observed performance rather than the mere existence of particular design features. Such PHOSITAs commonly compare alternative designs, evaluate competing approaches, perform testing and validation activities using target foods products, and rely on industry standards and measured performance data when making design decisions.

16. Consistent with the level of ordinary skill under my revised description, a PHOSITA would typically evaluate food-holding equipment by considering several variables, including physical properties of the food, food safety, food quality, heat transfer behavior, temperature consistency, moisture retention and migration, hold-time performance, operational requirements, applicable industry standards, and observed results during actual use.

III. PHOSITAs Evaluate Food-Holding Systems Based on Performance

17. In my experience, PHOSITAs responsible for commercial food-holding equipment ultimately evaluate systems by their observed food-holding performance rather than by the mere existence of particular components or design

features. Because the foodservice industry is highly regulated, consideration of food safety, observed, measured, and documented performance must be included.

18. PHOSITAs generally evaluate complete systems rather than isolated features. While individual components may be analyzed separately, functionality and performance are ordinarily evaluated in the context of the overall system in which those components operate, including the food product and the working environment. In my experience, conclusions regarding expected performance are more reliable when based upon the integrated system performance and measured results rather than isolated design features viewed independently, or modeled systems that have been evaluated theoretically without validation.

19. I have a working knowledge of standards used in the food industry and in the fabrication and evaluation of food processing equipment. Standards that apply to this case cover materials, products, services, systems, processes, safety, performance, testing, and similar areas.

20. A PHOSITA would understand the need to follow recognized standards and methods for the design, testing, and evaluation of commercial food-holding equipment. ASTM International (ASTM) and similar organizations publish standards governing foodservice equipment performance and testing. Such standards generally evaluate complete systems rather than isolated features or components. In my experience, specification, functionality, and performance of

commercial food-holding equipment are ordinarily evaluated on finished units. ASTM standards F3051, F2796, F2202, and F2140 (Exs. 2013-16) are test methods or specifications that cover hot-food holding equipment. The four ASTM standards referenced apply to complete systems, rather than isolated features or components.

21. Similar principles apply to food sensory evaluation. Accepted sensory methods evaluate food stored in complete, functioning systems and focus on observed outcomes such as texture, color, flavor, and overall product quality. See, e.g., International Standards Organization's (ISO) standards 11036, and 11037 (Exs. 2017-18) and ASTM Standard E1958 (Ex. 2019). Application of sensory testing standards require complete systems, rather than isolated features or components. Sensory testing methods of foods stored in commercial holding units rely on the availability of complete and functioning equipment.

22. In my experience, food-holding performance is a primary subject of engineering evaluation. PHOSITAs routinely ask whether a system achieves its intended performance objectives and whether food quality, safety, temperature consistency, moisture retention, hold time, texture, flavor, and operational requirements are satisfied during actual use. Components and design features are evaluated because they contribute to those outcomes. The outcomes themselves remain the focus of the engineering assessment.

23. Those outcomes are influenced by numerous interacting factors including heat-transfer mechanisms, heater placement, control logic, food composition, shape and variability, food moisture levels, hold duration, and operating temperatures.

24. A parts list or component list identifies what is present in a system. It does not reveal how heat is transferred into food, how moisture is retained, how temperatures change during holding, how food quality changes over time, and how the system operates in a given environment. PHOSITAs therefore evaluate temperature behavior, food quality, food safety, moisture retention, hold-time performance, operational stability, and other measurements obtained during actual operation.

25. In my experience, the engineering process usually begins with the performance objective and works backward toward equipment design. PHOSITAs ask whether food quality and safety are maintained, whether temperatures remain within the desired range, whether moisture is retained, and whether the system performs consistently during actual use. Components matter because they influence those outcomes. The food component is especially important as it is a natural material that changes in composition, properties, shape, and size and may significantly influence outcomes. The outcomes themselves are the focus of the evaluation.

IV. A PHOSITA Will Evaluate Alternatives Through Testing and Validation

26. Engineering design is often an iterative process involving planning, concept development, testing, evaluation, refinement, manufacturing, and startup. PHOSITAs commonly evaluate multiple alternatives before selecting a preferred design because performance objectives must be balanced against technical, operational, economic, and practical constraints. Competing alternatives may each appear technically reasonable. The preferred alternative is often identified only after performance has been evaluated through testing, observation, validation, refinement, or a combination of those methods. Accordingly, a PHOSITA does not evaluate food-holding technologies simply by identifying individual features and then assuming that expected performance will follow from combining those features. Quality and safety implications for the food product must be considered along with the equipment design.

27. While PHOSITAs frequently begin with expectations regarding how a system should perform, those expectations are either confirmed, refined, or rejected through testing. In my opinion, measured performance data provides a safer, and more reliable basis for evaluating a food-holding system than expectations based solely upon design descriptions or component selections. Environmental variables such as humidity, temperature, airflow, and the operator's skill may impact food holding system. Ex. 2020. The nature of the food product, or

variability in the food properties due to seasonal changes in ingredients and variation between batches are examples of “noise” that can further impact outcomes.

28. PHOSITAs also do not ordinarily determine the functionality or performance of a commercial system by importing individual features from separate manuals, service documents, specifications, website materials, and other technical documents whenever information is absent from one source. Such an approach may be useful for gathering information, but engineering conclusions generally require identification of the particular configuration being evaluated as a system, including the documentation associated with that configuration, followed by testing with targeted food products. Without those steps, functionality and performance conclusions are unreliable.

29. In my experience, food-holding performance frequently depends on multiple interacting variables, and competing alternatives may each appear technically reasonable before testing is performed. PHOSITAs therefore must use testing, measurement, validation, and observation to determine how systems actually perform under operating conditions. In a USDA funded food dehydration project, validation efforts demonstrated that variables initially believed to be insignificant could materially affect system performance, while variables initially

believed to be significant sometimes had insignificant effect. Testing was necessary to determine which variables actually governed performance outcomes.

30. Validation is performed because expected performance must be confirmed and shown to be repeatable. Testing and validation allow PHOSITAs to determine whether a process or system actually behaves as intended and these activities are required by regulators and inspectors when food safety hazards are present.

31. Equipment descriptions, drawings, component lists, and design specifications identify the architecture of a system. They do not establish how food products will perform during use. PHOSITAs determine performance through testing, observation, and measured results.

32. Testing becomes particularly important where alternative designs or architectures are being compared because design descriptions alone do not reveal whether competing systems will produce similar food-quality outcomes. Accordingly, PHOSITAs generally rely on measurement and validation rather than assumption when evaluating alternative designs. Inspectors from the local health department, the FDA, USDA, and third-party auditors require physical measurement and validation when food safety risks are present.

33. Engineering decisions are rarely driven by a single variable. In practice, PHOSITAs commonly use a systems approach to evaluate multiple

interacting variables and constraints simultaneously. Performance objectives, operating conditions, product characteristics, equipment capabilities, and practical limitations are considered together when determining whether a particular design achieves its intended purpose.

V. Thermal Architecture Is One Important Variable Affecting Performance

34. Food-holding systems employ different thermal architectures.

Examples include radiant heating systems, conductive heating systems, convective heating systems, phase-change systems, heat-sink systems, controlled and uncontrolled heater systems, and combinations of approaches.

35. Architectural choices influence how thermal energy is transferred into the food product. Those choices may influence food safety, food quality, temperature distribution, moisture retention, moisture migration, product texture, food-surface conditions, sensory experience, color, and other performance outcomes observed during holding. During my career as a food process engineer, I have analyzed and validated the performance of many batch and continuous thermal systems including ovens, cookers, smokers, holding-containers, freezers, refrigerators, kettles, grills, fryers, and similar equipment featuring a variety of thermal energy transfer strategies. In recent years FDA and USDA inspectors have urged processors to validate thermal systems when a food safety hazard is present. Ex. 2021.

36. PHOSITAs therefore evaluate architectural alternatives because those alternatives may produce different performance outcomes under actual operating conditions.

37. When a company selects one architecture rather than another, that choice typically reflects an engineering judgment regarding expected performance and operational objectives.

VI. Duke's Contemporaneous IRHS Materials Describe a Specific Technical Approach

38. I reviewed the Duke IRHS materials identified in the Petition. Those materials repeatedly identify Quartz IR Emitters, InfraRed + HeatSink technology, pulsed infrared operation, adaptive infrared operation, and IR Turbo Boost functionality (Ex. 1005, at 4, 15, 20, 21, 23-27; Ex. 1006, at 1; Ex. 1007, at 8, 10, 11, 21, 53, 67; Ex. 1008, at 1, 42-44, 50, 58-64; and additional exhibits, Ex. 1033, at 92, 93, 94, 113; Ex. 2033; Ex. 1035, at 5; Ex. 1027; Ex. 2008, at 1-2).

39. The Duke IHRS materials do not simply identify those features. Duke's documents repeatedly associate those IHRS features with improved food quality, improved consistency, and extended hold-time performance (EX 1005, at 4, 16; EX 1006, at 1; EX 1007, at 8, 9, 11, 12, 21, 33, 53, 67; and additional exhibits, Ex. 2033; Ex 1033, at 83, 94, 100, 105, 113; EX 1035, at 5; Ex. 2034, at 1; Ex. 2008, at 1-2).

40. In my opinion, the referenced IRHS materials consistently describe a system whose performance is linked to identifiable architectural features. The materials repeatedly explain how those features were expected to influence food quality, consistency, and hold-time performance.

41. I further reviewed Dr. Vallee's discussion regarding the IRHS materials. Dr. Vallee explains that a PHOSITA would supplement information contained in one IRHS document with information contained in another IRHS document whenever information is absent, ambiguous, or incomplete. See, Ex. 1003, ¶¶123-126. Engineers generally do not draw functionality or performance conclusions by importing features from different technical materials without first establishing that those materials describe the same configuration.

42. In my experience, commercial foodservice equipment commonly evolves through laboratory testing, prototype development, prototype releases, production releases, field testing, customer feedback, product formulation, geometry and properties, firmware revisions, controller revisions, and revised technical documentation. PHOSITAs therefore identify a specific configuration before evaluating functionality or performance.

43. PHOSITAs do not ordinarily determine system functionality by freely combining features from different generations of manuals, specifications, service documents, firmware revisions, and other materials unless it is first established that

those materials describe the same configuration. Reliable engineering conclusions generally require identification of the specific configuration and application under evaluation.

VII. The Technology Validation Process Reflects Accepted Engineering Practice

44. I reviewed records of Prince Castle, the predecessor of Marmon Foodservice Technologies, relating to testing and evaluation of food-holding systems later claimed in the '002 patent.

45. Those materials reflect sensory testing, comparative evaluations, temperature validation, energy testing, and field validation.

46. Nothing in those records appears unusual from an engineering perspective. The records describe a structured evaluation process in which competing alternatives were compared using measured performance data.

47. Sensory testing, temperature validation, comparative testing, and field validation are commonly used when performance outcomes must be established through data rather than assumption. In my experience, food-holding performance depends on multiple interacting variables, including heat-transfer behavior, temperature distribution, moisture retention, controller operation, food composition, and hold duration. Because those variables interact, engineers and foodservice operators do not ordinarily rely upon design descriptions alone to predict food-quality outcomes. Instead, testing and validation are used to determine

whether competing systems actually achieve the desired sensory, operational, safety, and food-quality objectives under real-world conditions. Food-quality outcomes such as color, texture, flavor, and moisture retention may be affected by temperature, humidity, airflow, hold duration, and other variables.

48. In my opinion, the Prince Castle records reflect a technical evaluation process directed toward determining actual performance of an integrated system of components and food, rather than assuming equivalent performance among individual parts taken from competing food-holding systems.

VIII. Significance of Independent Upper and Lower Temperature Control

49. I reviewed the Prince Castle April 2015 deployment records, Exs. 2022-31 and the April 2015 DHB-BK24 Rev. A Manual, Ex. 2032, (herein “the Prince Castle April 2015 records”).

50. The deployment records reference “Dual Temp” functionality and efforts to enable that functionality during system deployment.

51. Independent upper and lower-temperature control permits PHOSITAs to introduce thermal energy into food products differently from above and below and to adjust those thermal inputs independently.

a. Such control allows PHOSITAs to introduce more precise levels of thermal energy per unit surface area of the food products, therefore

maintaining food temperature and quality conditions over a wider range of conditions.

b. Such control gives PHOSITAs improved means to regulate the boundary conditions of food products, reducing thermal lag time and improving system performance.

c. Such control allows PHOSITAs to create and maintain different temperature profiles within a holding environment and to evaluate how those profiles affect food-surface temperature, moisture retention, texture, sensory quality, safety, and overall holding performance.

52. In my experience, commercial and industrial food-holding systems, like restaurants, warehouses, and factories, frequently utilize multiple holding bays associated with a common temperature-control zone. This arrangement permits multiple portions of the same food product to be maintained under a common set of temperature-control parameters while providing operational flexibility for replenishment, product rotation, and inventory management. A PHOSITA would recognize that such zone-and-bay architectures represent deliberate engineering and operational design choices rather than arbitrary configuration decisions.

53. Independent temperature control capability and independent heater control capability identify what a system is capable of doing. They do not by themselves establish how the resulting system will perform with respect to food

quality, temperature consistency, moisture retention, hold-time performance, or other operational objectives. PHOSITAs commonly evaluate those outcomes through testing and validation.

54. In my opinion, independent upper- and lower-temperature control represents a meaningful engineering capability rather than a minor software feature.

55. The Prince Castle April 2015 records indicate that such functionality was actively being configured and deployed at Burger King locations during that period.

IX. PHOSITAs Evaluate Specific Configurations

56. PHOSITAs commonly encounter situations in which a product family evolves over time, as in an environment where continuous improvement is practiced. In those circumstances, determining functionality requires identifying the specific configuration being evaluated. PHOSITAs therefore identify the specific configuration under evaluation before drawing conclusions regarding functionality or performance. Identification of the subject system is an ordinary part of the ASTM standards identified in paragraph 20 for evaluation of food-holding systems.

57. Such evolution may involve laboratory testing, prototype systems, production systems, field testing, customer feedback, firmware revisions, controller revisions and revised technical documentation.

58. Different revisions, firmware versions, production releases, prototypes, and service configurations frequently exhibit different functionality. PHOSITAs therefore identify the specific configuration under evaluation before drawing conclusions regarding system operation or performance. Consequently, PHOSITAs generally avoid drawing conclusions until the specific configuration at issue has been identified.

59. PHOSITAs evaluating system functionality ordinarily identify the specific configuration being evaluated, and functional conclusions are typically tied to a particular version or configuration.

60. In my opinion, PHOSITAs do not ordinarily determine the functionality of a commercial food-holding platform by freely combining features from different generations of manuals, specifications, firmware revisions, service documents, and other materials without first establishing that those materials describe the same configuration. Reliable engineering conclusions generally require identification of the specific configuration under evaluation. The engineer does not assume that a group of selected parts from different models or versions will perform to expectations as an integrated system.

61. A reliable engineering evaluation generally requires identification of the specific equipment configuration and food product under consideration, particularly when food safety issues apply.

X. Conclusions

62. Based on my review of the materials identified herein and my experience working with food-holding and food-processing systems, I have reached the following conclusions.

63. Food-holding performance is ordinarily evaluated through testing, measurement, validation, or some combination of those methods because food-holding performance depends on multiple interacting variables and cannot reliably be inferred from equipment descriptions alone.

64. Architects, engineers, equipment developers, and foodservice operators commonly value alternative designs and validate performance before broader deployment decisions are made.

65. Thermal architecture is one engineering variable affecting food-holding performance because architectural choices influence how thermal energy reaches the food product and may affect resulting performance outcomes.

66. The Duke IRHS materials describe a specific thermal architecture that Duke repeatedly associated with food-quality and hold-time objectives.

67. The Prince Castle records reflect an evaluation process that is consistent with accepted engineering practice for assessing competing food-holding systems.

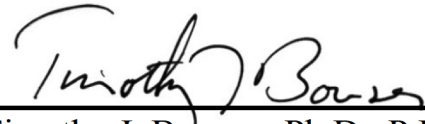
68. The Prince Castle independent upper and lower temperature control is a significant feature that enables improved performance and control of a food holding system and is not a minor software feature.

69. Specific configurations of a commercial food-holding platform are identified and defined when making an engineering evaluation of the product, including the food component, especially regarding food quality and safety. Selected parts from different models or versions may not perform to expectations when theoretically combined in an unproven system.

70. I reserve the right to supplement these opinions should additional materials become available.

I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that all 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 Title 18 of the United States Code.

Date: October 06, 2026

A handwritten signature in black ink, reading "Timothy J. Bowser". The signature is written in a cursive style with a large, stylized 'T' and 'B'.

Timothy J. Bowser, Ph.D., P.E.