

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CEVA SANTÉ ANIMALE S.A.,
EGG-CHICK AUTOMATED TECHNOLOGIES S.A.S, and
CEVA ANIMAL HEALTH, LLC

Petitioners,

v.

TARGAN, INC.,
Patent Owner.

Case No. IPR2024-00595
U.S. Patent No. 10,806,124

**DECLARATION OF KEVIN M. KEENER, PH.D., P.E.,
IN SUPPORT OF PATENT OWNER'S RESPONSE CONCERNING
U.S. PATENT NO. 10,806,124**

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I. INTRODUCTION

1. I, Kevin M. Keener, Ph.D., P.E., submit this declaration to state my opinions on the matter described below.

2. I have been retained by Patent Owner Targan, Inc. (hereafter, “Patent Owner” or “PO”), as an independent expert in this proceeding before the Patent Trial and Appeal Board (hereafter “PTAB” or “Board”) of the United States Patent and Trademark Office (hereafter “USPTO” or “Office”). I am being compensated at my usual and customary rate of \$800 per hour, no part of my compensation depends on the outcome of this proceeding, and I have no other interest in this proceeding.

3. I understand that this proceeding involves U.S. Patent No. 10,806,124 (the “’124 patent”), and I have been asked to consider the validity of certain claims of the ’124 patent in view of several grounds laid out in a Petition filed on February 20, 2024 that names Ceva Santé Animale S.A., Egg-chick Automated Technologies S.A.S., and Ceva Animal Health, LLC as Petitioners (hereafter, “Petitioners” or “Ceva”). IPR2024-00595, Paper 1 (“Pet.”). I been asked to consider each of the eight grounds laid out in the Petition, and have also been asked to consider the state of the art and prior art available as of November 13, 2015, both from the perspective of a person of ordinary skill in the art at that time. Based on the grounds presented by

Petitioner, my experience and knowledge of the industry, the legal standards explained to me by counsel, and the prior art referenced in those grounds, it is my opinion that Ceva has not shown that claims 1-18 of the '124 patent are invalid.

II. QUALIFICATIONS AND BACKGROUND

4. I believe that I am well qualified to serve as a technical expert in this matter based upon my educational and work experience, and specifically, in the field of agricultural and food process engineering, and my consulting and research work involving design of agricultural technologies including food conveyors, automated sorting equipment, industrial poultry production, and image processing. My curriculum vitae ("CV") is submitted as Exhibit 2007.

5. Of note, as shown in my CV, I have extensive experience in design and evaluation of food processing and food sorting equipment, including those involved in poultry hatcheries including industrial poultry sexing and image processing.

6. I received B.S. and M.S. degrees in Agricultural Engineering from The Ohio State University in 1990 and 1993, respectively, and a Ph.D. degree in Food Process Engineering from Purdue in 1996.

7. In addition to my technical degrees, I have over 25 years of experience including extensive experience in the fields of agricultural engineering, food processing and manufacturing, and compliance with USDA, FDA, EPA, and OSHA regulations.

8. Since 2019, I have been a professor in the School of Engineering and the Barrett Family Foundation Chair in Sustainable Food Engineering at the University of Guelph in Ontario, Canada. I lead a ten-person research team in the research and development of novel food technologies for food safety and food quality enhancement. I also have visiting professor appointments at South China University of Technology, University College Dublin (Ireland), and Dublin Technical University (Ireland). Since 1999, I have been a licensed, professional engineer (P.E.). I am also a Fellow of the American Society of Agricultural and Biological Engineers (ASABE) and the Institute of Food Technologists. I have won several awards for my research and food safety training programs.

9. From 1997 to present, I have provided over 100 training workshops for over 2,500 persons in industry, government, and academia. I have previously developed USDA and FDA on-line training courses in food plant sanitation, demonstrating the use of bioluminescent detection methods for cleaning efficacy.

10. From 2005 to 2015, I was a Professor of Food Science and Ag. and Bio. Engineering at Purdue University where established a national food processing environmental assistance center for small and medium food manufacturers to provide regulatory assistance in setting up environmental testing programs. I also co-directed the food entrepreneur's technical assistance program. In this role, I with two staff provided individualized technical assistance to over 150 individuals and small companies per year on food manufacturing requirements, including the design of food safety programs for FDA and USDA compliance including development of Hazard Analysis and Critical Control Point (HACCP) Programs as required by USDA and PCQI (Preventive Controls Qualified Individual) programs as required by FDA. As part of these assistance efforts, I designed food manufacturing facilities, audited food safety programs for existing food and pet food manufacturing facilities. Some of the key programs developed and audited included prerequisite programs including cGMP's, Sanitation Standard Operating Procedures (SSOP's), allergen control, inventory control, the identification of microbiological hazards and appropriate microbiological testing methods for pathogen detection within specific food products and food facilities.

11. I have significant experience working with food manufacturers on food safety compliance as I have visited hundreds of food manufacturing facilities over my career and understand the complexities and challenges of food manufacturing. I have worked with major international food companies on food pathogen detection methods, pathogen method validation, regulatory compliance with pathogen testing, food safety import and export requirements, testing requirements for pathogens such as Salmonella, Listeria monocytogenes, E. coli O157:H7, and others in raw meat, fresh fruits and vegetables, ready-to-eat foods, refrigerated foods, food processing plant environments and on food manufacturing equipment.

12. I have published over 100 refereed research articles, 1 book, 10 book chapters, 37 non-refereed, 5 patents, 42 extension articles, 55 abstracts, and 33 invited papers; published over 100 popular press articles; organized and delivered over 100 technical workshops (HACCP, Food safety, FSMA, GFSI, food plant sanitation, egg processing, emerging technology, LACF, etc.) to over 2500 persons.

13. I have expertise in the design of food safety systems, food packaging solutions, food processing improvements, food technology evaluations, integration of non-thermal technologies (atmospheric cold plasma, irradiation, high pressure processing, chlorine dioxide, UV,

antimicrobial rinses and washes) into food production and food manufacturing processes, auditing of food safety practices (plant sanitation, HACCP plans, food safety system management, process validation, regulatory compliance), and troubleshooting food processing and food safety issues. My commodity expertise includes shell eggs, dairy products, baked foods, fried foods, fruits and vegetables, cereal grains, seafood, poultry, pork, beef, and alcoholic beverages.

14. I have provided expert testimony and consulting expertise in over 25 litigations (personal injury, construction defects, patent infringement, and others) involving food safety, food technology, food preservation, food packaging, and food regulations in State and Federal Court, including the U.S. Court of Appeals.

15. I have written expert reports, provided technical training, and consulting services to the United States Department of Agriculture's Food Safety Inspection Service (USDA-FSIS) and Food and Drug Administration (FDA) personnel on food regulations and processing related issues including the Food Safety Modernization Act, food recall requirements, GFSI, food traceability standards, and HACCP. I have also provided technical expertise on over 60 food and bio manufacturing projects for U.S., European food processors and non-government organizations (NGO's).

16. In my nearly 25 years of experience in agricultural engineering and food process engineering, I have acquired significant knowledge about automated food processing equipment and procedures, animal processing equipment and procedures, image processing, and the rules, standards, motivations, understanding, and expectations that organizations in these fields, and persons of ordinary skill in the art (addressed below) have and would have had as of the time of the '124 patent.

III. LEGAL STANDARDS

17. In forming my opinions and considering the subject matter of the '124 patent and its claims in light of the grounds presented in the Petition, I am relying on certain legal principles that counsel in this case explained to me. My understanding of these concepts is summarized below.

18. I understand that the claims define the invention. I also understand that an unpatentability analysis is a two-step process. First, the claims of the patent are construed to determine their meaning and scope. Second, after the claims are construed, the content of the prior art is compared to the construed claims.

19. I understand that a claimed invention is only patentable when it is new, useful, and non-obvious in light of the “prior art.” That is, the

invention, as defined by the claims of the patent, must not be anticipated or rendered obvious by the prior art.

20. I understand that it is the patent challenger's burden to show invalidity by a preponderance of the evidence in this proceeding.

A. Claim Construction

21. I understand that the United States Patent and Trademark Office interprets claim terms in an *inter-partes* review proceeding under the same claim construction standard that is used in a United States federal court. I understand that under this standard, the meaning of claim terms is considered from the viewpoint of a person of ordinary skill in the art at the time of the alleged invention (sometimes abbreviated as "POSITA").

22. I understand that claim terms are generally given their ordinary and customary meaning as understood by a person of ordinary skill in the art in light of the specification and the prosecution history pertaining to the patent. However, I understand that claim terms are generally not limited by the embodiments described in the specification. I further understand that claim terms are given their plain an ordinary meaning absent two exceptions: 1) an inventor may clearly define a claim term in the specification or the prosecution history to mean something other than its ordinary meaning, and 2) an inventor

may clearly and intentionally disclaim certain claim scope within the specification or prosecution history.

23. I understand that in addition to the claims, specification, and prosecution history, other evidence may be considered to ascertain the meaning of claim terms, including textbooks, encyclopedias, articles, and dictionaries. I have been informed that this other evidence is often less significant and less reliable than the claims, specification, and prosecution history.

B. Anticipation Under 35 U.S.C. § 102

24. I understand that under 35 U.S.C. § 102, a patent claim is invalid if its subject matter was patented or described in a printed publication before the effective filing date of the claimed invention. I understand that this is referred to as invalidity by anticipation. Also, I understand that a patent claim is anticipated under § 102 if a single prior art reference discloses all limitations of the claimed invention.¹

C. Obviousness Under 35 U.S.C. § 103

25. I understand that a patent claim is invalid as obvious if the claimed invention would have been obvious to a person of ordinary skill in

¹ I understand that none of Petitioner's grounds contend that any of claims 1-18 of the '124 patent are anticipated by any single prior art reference.

the art (“POSITA”) at the time the claimed invention was made. This means that even if all of the elements of the claim cannot be found in a single prior art reference that would anticipate the claim, a POSITA would still have come up with the claimed invention. I understand that in an obviousness determination, the POSITA is presumed to have knowledge of all relevant prior art. I understand that for a reference or combination of references to render patent claims invalid the patent challenger must show there was a motivation to modify a reference or to combine references, and that there would be a reasonable expectation of success (“RES”) in doing so. I understand that whether a claim is obvious is based upon the determination of several factual issues.

26. I understand that obviousness is a determination of law based on underlying determinations of fact. I understand that these factual determinations include the scope and content of the prior art, the level of ordinary skill in the art, the differences between the claimed invention and the prior art, and secondary considerations of non-obviousness.

27. In considering obviousness, I understand that one must determine the scope and content of the prior art. I understand that, in order to be considered as prior art to a patent being considered, a prior art reference must be reasonably related to the claimed invention of that patent. A reference

is reasonably related if it is in the same field as the claimed invention or is from another field to which a person of ordinary skill in the art would look to solve a known problem.

28. I understand that one must determine what differences, if any, existed between the claimed invention and the prior art.

29. I understand that a patent claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was independently known in the prior art. In evaluating whether such a claim would have been obvious, one must consider whether a motivation has been identified that would have prompted a POSITA to combine the elements or concepts from the prior art in the same way as in the claimed invention.

30. I understand that whether a prior art reference renders a patent claim unpatentable as obvious is determined from the perspective of a POSITA at the time of the alleged invention. There is no requirement that the prior art contain an express suggestion to combine known elements to achieve the claimed invention, but a suggestion to combine known elements to achieve the claimed invention may come from the prior art, as filtered through the knowledge of one skilled in the art. In addition, the inferences and creative steps a person of ordinary skill in the art would employ must also be considered in the determination of obviousness.

31. I understand that there is no rigid rule that a reference or combination of references must contain a “teaching, suggestion, or motivation” to combine references. But I also understand that the “teaching, suggestion, or motivation” test can be a useful guide in establishing a rationale for combining elements of the prior art. This test poses the question as to whether there is an express or implied teaching, suggestion, or motivation to combine prior art elements in a way that realizes the claimed invention, and that it seeks to counter impermissible hindsight analysis.

32. I understand that one should consider, when evaluating whether a POSITA would have motivation and expectation of success in modifying a system or method disclosed in the prior art, whether (1) the change was merely the predictable result of using prior art elements according to their known functions, or whether it was the result of true inventiveness; (2) there is some teaching or suggestion in the prior art to make the modification or combination of elements claimed in the patent; (3) the claimed innovation applies a known technique that had been used to improve a similar device or method in a similar way; (4) the claimed invention would have been obvious to try, meaning that the claimed innovation was one of a relatively small number of possible approaches to the problem with a reasonable expectation of success by those skilled in the art; (5) the invention merely substituted one known

element for another known element in order to obtain predictable results; (6) the invention merely applies a known technique to a known device, method, or product to yield predictable results; or (7) known work in the field may have prompted variations of use of the same inventions in the same or different fields due to market forces or design incentives that would have been predictable to a POSITA.

33. I also understand that a reference may be said to teach away when a POSITA, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. Even if a reference is not found to teach away, I understand its statements regarding preferences are relevant to a finding regarding whether a POSITA would be motivated to combine that reference with another reference.

34. I further understand that one of the factual inquiries when determining the obviousness of a patent claim is to consider objective evidence related to the issue of obviousness, sometimes called “secondary considerations of non-obviousness” or “objective indicia of non-obviousness.” I understand that secondary considerations, or “objective indicia,” of non-obviousness are critical in the overall inquiry under 35 U.S.C. § 103, and can often establish that an invention appearing to have been

obvious in light of the prior art was not. I understand that these “objective indicia” include (1) long-felt need; (2) failure of others; (3) commercial success; (4) copying by and praise from infringers; (5) unexpected results. I understand that such objective indicia may often be the most probative and cogent evidence of nonobviousness, and can be crucial in preventing hindsight bias, which can distort the obviousness analysis. I further understand the patent owner bears the burden to show secondary factors support non-obviousness.

35. I understand that any assertion of secondary considerations of non-obviousness must be accompanied by a nexus between the claimed features and the relevant secondary consideration. I further understand that when a nexus exists between these secondary considerations and the claimed invention, this evidence can carry substantial weight.

IV. SUMMARY OF OPINIONS

36. In the analysis that follows, I detail my conclusion that the combinations of prior art identified by the Petitioner, in my opinion, do not disclose and/or render obvious any of the claims of the '124 patent.

37. In my opinion, Petitioner's arguments fail for two main, independent reasons: 1) none of Petitioner's combinations disclose all

limitations of any of the '124 patent independent claims (claim 1, 6, and 9);²
2) a POSITA would not have been motivated to make the combinations or modifications presented, nor would they have had a reasonable expectation of success (“RES”) in doing so.

38. Petitioner relies on the same references as prior art for the same or similar limitations across different grounds. Consequently, in many cases my discussion of one prior art reference in the analysis of one ground is equally applicable to Petitioner’s same/similar use of the reference for the same/similar claim language in another ground.

A. Petitioner’s Combinations Fail to Disclose All Limitations of the Independent Claims

1. Gershman (Ex. 1003)

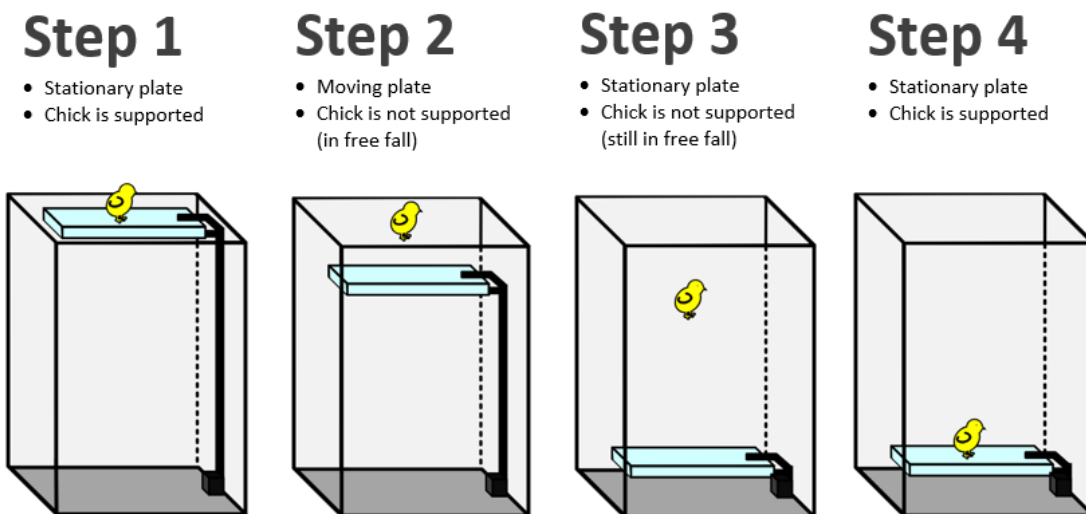
39. I understand that Petitioner relies on Gershman as disclosing the limitations “a moving platform to support an unrestrained chick” (with respect to claims 1 & 9 and their dependents) and “a moving platform upon which an unrestrained chick is supported” (with respect to claim 6 and its dependents),³ but Gershman does not actually disclose any of these limitations. As claimed in the '124 patent, the platform supports the chick when the platform is

² Grounds 1-4 and 7-8 proffer combinations purportedly disclosing the limitations of the independent claims, but none do.

³ Grounds 1, 4, 6 and 7 rely on a purported combination of Gershman and Pierre.

actually in motion (*i.e.*, moving). Gershman teaches precisely the opposite of this because its platform is designed to achieve a free-fall condition and **to not support** the chick when the platform is in motion.

40. In particular, Gershman discloses using a plate that is stationary in some stages of operation, and moving in other stages of operation. When stationary, the plate is supporting a chick. When put into motion, it is specifically designed to move downward so quickly that it will not support the chick at any moment. Those are the only two options for Gershman's plate; it is either stationary and supporting a chick or moving and not supporting the chick, **but never moving and supporting a chick**. As shown in the below graphic I had created to illustrate the process, in Gershman, the chick is initially supported by a plate that is stationary in Step 1:



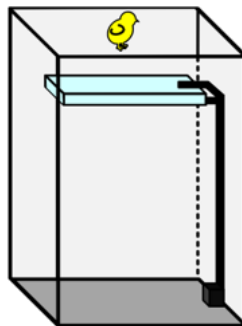
41. As illustrated by the above demonstrative, the plate is a movable platform that supports the chick in Step 1. Notably, the claims never recite a merely “movable platform to support an unrestrained chick,” and instead they all recite a “moving platform to support an unrestrained chick.” See ’124 patent at claim 1 (“a moving platform to support an unrestrained chick of a particular breed”), claim 2 (“the moving platform”), claim 4 (“determines which sex will remain on the moving platform”; “determined sex remaining on the moving platform”), claim 5 (“a moving platform position altering device”), claim 6 (“a moving platform upon which an unrestrained chick is supported”), claim 8 (“the moving platform”), claim 9 (“a moving platform to support an unrestrained chick of a particular breed”; “an image capture device positioned proximate to the moving platform to capture at least one image of the chick as it passes on the moving platform”; “the moving platform”; “the moving platform”), claim 12 (“the moving platform”), claim 13 (“a moving platform position altering device”), claim 14 (“one stimuli proximate to the moving platform”). In my opinion, a POSITA would understand this to mean the chick must be supported by a plate that is in motion (moving), not simply supported by a plate that is stationary but could potentially be movable. This is not a minor distinction, particularly in industrial chick hatching operations

in the 2015 timeframe, where high throughput while the sexing process is carried out was (and remains) so critical to success.

42. As illustrated at Step 2 of the demonstrative I mentioned above, shown in the cropped figure below, the movable plate is accelerated downward at a rate faster than the acceleration of free fall (i.e., faster than gravitational acceleration and faster than any reactive response the chick may have to try to push against the plate as it is dropping), such that the chick enters a purely free fall condition where it has no support from the plate whatsoever. In other words, the system is specifically designed such that as soon as the plate becomes a “moving” plate it does not support the chick. The chick is in free fall any time the plate is moving.

Step 2

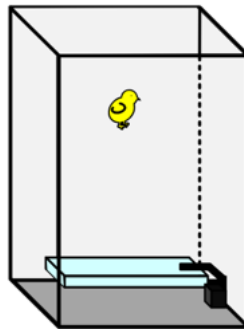
- Moving plate
- Chick is not supported (in free fall)



43. At Step 3, shown in the cropped figure below, the plate comes to a full stop, before the chick lands on it, and assumes a stationary state again as the chick continues its unsupported free fall downward.

Step 3

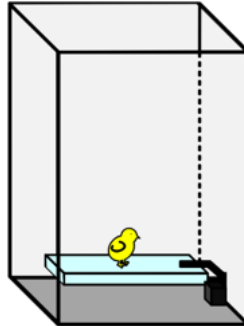
- Stationary plate
- Chick is not supported (still in free fall)



44. At Step 4, shown in the cropped figure below, the chick finally lands on the plate, which is still stationary at this point (the stationary state achieved in Step 3), and the chick is then again supported by the stationary plate.

Step 4

- Stationary plate
- Chick is supported



45. In my opinion, the only time the Gershman plate is a *moving* platform is during Step 2, but in Step 2 the Gershman plate does not support the chick, and the only time the Gershman plate actually supports the chick is when it is **not** a moving platform but rather a stationary platform (at Steps 1, 3-4).

46. Accordingly, in my opinion Gershman does not disclose, teach or suggest the limitations of a moving platform to support an unrestrained chick, which is required by each independent claim of the '124 patent, and all of the dependent claims by virtue of their dependency.

47. Instead, in my opinion Gershman teaches away from the claimed features by requiring that its platform provide no support whatsoever when the platform is moving.

48. Additionally, I note that Gershman is silent on how to deliver the chick to the imaging plate, position the chick on the imaging plate, and regulate the motion of the imaging plate. Instead, Gershman only shows a manual (hand-motion) operation, which is counter to the industries' high-volume (hundreds of chicks per minute) chick sorting activities.

2. Pierre (Ex. 1004)

49. I understand that Petitioner relies on Pierre as disclosing the claimed “database of images” of chick features required by all independent claims. However, Pierre does not disclose any database at all. And under no interpretation of Pierre would a POSITA consider Pierre to disclose a database of images as required by the claims:

- “male and female wing patterns” (claim 1 and its dependents)
- “healthy and unhealthy chicks of the same breed” (claim 6 and its dependents)
- “predetermined feature of a chick” (claim 9 and its dependents).⁴

In practice, different breeds of chickens can have different wing patterns (including difference between genders), can be subject to different health ailments, and can have different features common to their breed (or

⁴ Petitioner relies on Pierre as disclosing this limitation for all Grounds, and the failures of Pierre discussed herein reflect an apparent oversight by Petitioners that plagues all of their asserted grounds.

gender), and thus the claimed system calls for multiple images (in a database or equivalent) to provide the information needed to accurately differentiate between, e.g., male and female chicks, healthy and unhealthy chicks, and/or chicks having physical attributes of special interest. Pierre cuts the other direction, and suggests using just a single reference image for each chick being examined. Because of this, Pierre does not need, and does not even mention, a database of any type, or anything that could be considered equivalent thereto.

50. Moreover, Pierre is silent on which attributes he is selecting for or how he will reliably generate a bird's "fall" or collect these images during the bird's fall in a high speed sorting process. At best, Pierre discloses comparing an image of a chick to a single reference image, and in my opinion this does not meet the claim language requiring comparing an image of a chick to a database of images of the types noted above.

3. Yavnai (Ex. 1005)

51. As an apparent alternative to Gershman, in Grounds 2 and 8, I understand Petitioner relies on Yavnai as allegedly disclosing the limitations of "a moving platform to support **an unrestrained chick**" with "an image

capture device to capture at least one image of **the chick**.”⁵ It appears that Petitioner treats “the chick” as a new or different chick than the “unrestrained chick” introduced earlier in the claim. That is not how I understand the plain meaning of the claim language, and in my opinion it is not how a POSITA would have understood the plain meaning of the claim language. Based on my understanding, the antecedent basis for “the chick” imaged is “an ***unrestrained*** chick” introduced in the following limitations for claims 1, 6 and 9 respectively:

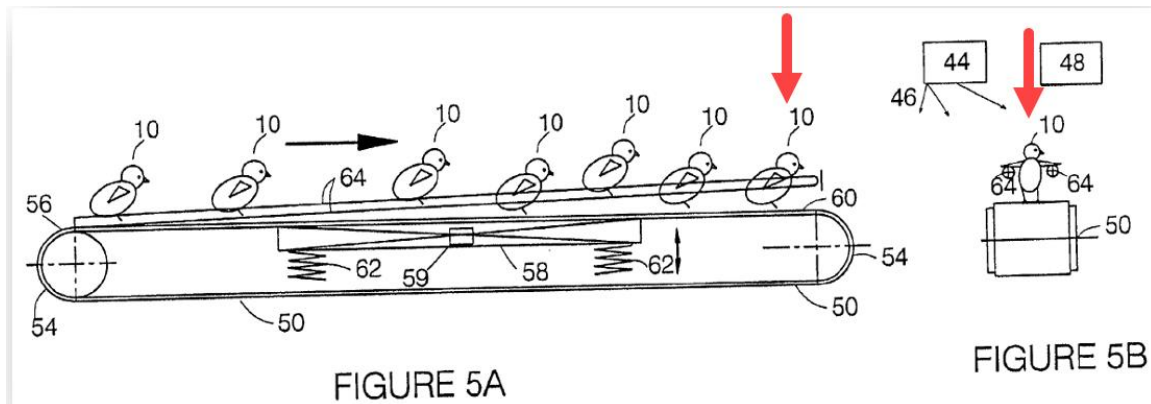
- “a moving platform to support an unrestrained chick of a particular breed” (claim 1)
- “a moving platform upon which an unrestrained chick is supported” (claim 6)
- “a moving platform to support an unrestrained chick of a particular breed” (claim 9)

52. In my opinion these limitations, as well as the later chick imaging limitations in each of the claims, cannot be met by Yavnai’s system because a POSITA would understand that in Yavnai’s system the chick is ***restrained*** at the time of imaging. In fact, Yavnai is representative of the prior art at the time that included the kind of restraints that the ’124 patent was

⁵ Petitioner relies on Yavnai as disclosing this limitation for Grounds 2 & 8, but does not rely upon Yavnai in any other Grounds.

designed to avoid, and over which the '124 patent represents a significant improvement.

53. In my opinion, Figures 5A and 5B of Yavnai would have made it indisputably clear to the POSITA that at the time the chick in Yavnai is imaged (60) (which occurs at the point identified by the red arrows added to Yavnai's Figures 5A and 5B, below), the chick is restrained by poles (64), which keep the chick in the exact position needed to take its picture:



54. In my opinion, a POSITA would have understood that the chick in Yavnai is restrained in at least two ways. First, the body of the chick is restrained from lateral movement by the poles (64) over the entire length of the conveyor, starting with the poles being adjacent to the chick's legs and feet and then upward adjacent to the sides of the chick's body to the point when the chick is imaged (best shown in Figure 5B). Notably, the Yavnai system has no side walls, which are necessary to keep the chick on the moving platform when, as in the '124 system, it is free to move about. Thus, the

POSITA would understand that the narrow and constricting poles of Yavnai must be configured to restrain the chick from lateral movement for the duration the chicks are on the moving platform, or they would potentially fall off. Notably, Petitioner appears to understand that the poles restrain the chick from lateral movement over the entire moving platform. Petitioner argued that “[t]he chick can also move backwards and forwards along the conveyor belt,” but was unable to go further to say that the chick cannot move laterally in unrestricted manner (because it cannot). Pet. at 25. The Petitioner thus appears to tacitly acknowledge that the chick *cannot* move laterally due to the poles. *Id.*

55. Second, the chick’s wings are restrained by the poles (64), which keep the wings in an open state. These poles are said to “support” the chick’s wings, meaning support them in an open state and prevent/restrict the chick from closing its wings as it would naturally do absent the poles. Yavnai at Abstract (“two poles support[] the spread wings”); [0042] (“Poles 64 support the spread wings ...”). That Yavnai refers to these as “support” poles only confirms they “support” the wings in an open position (“spread” wings), and would be unnecessary if the chick had closed or folded wings. Ex. 1005 at [0042]. A POSITA would understand that Yavnai’s poles are there to provide an upward supporting force preventing the chick from closing its wings while

stimulated. The support poles have no function other than to limit the movement of the chick's wings and body and thus restrain them. A POSITA would understand that the support poles (64) are positioned narrowly enough to one another that they start restraining the chick laterally as soon as the chick gets on the platform and over the whole length of the platform. Accordingly, a POSITA would understand that in Yavnai, at the time the chick is imaged, poles 64 restrain the chick laterally and restrain the chick's wings, preventing them from closing.

B. The POSITA Would Not Have a Motivation to Combine or Reasonable Expectation of Success

56. Petitioner's obviousness arguments also fail because it has not shown any motivation to combine its proffered references, nor shown that a POSITA would have had any expectation of success in doing so. I have reviewed the Petition, and not only does it never mention the word "motivation", but it also never provides any evidence for why a POSITA would have had a motivation to make any of the eight combinations Petitioner asserts. Even so, in each of its asserted grounds the Petitioner relies *heavily* on what a POSTA would have known or found obvious. But instead of providing evidence or analysis from someone with an understanding of a POSITA's perspective at the time of the invention, Petitioner simply states in conclusory fashion that its combinations would have been obvious, gaps in

the prior art would have been obvious, and/or that success would have been expected. The Petitioner's heavy reliance on these conclusory and unsupported statements is extensive: *see* Pet., 23 (“[i]t would have been obvious to store a collection of reference images in a database in order to organize the collection of reference images.”); 24 (“[i]t would have been obvious to a POSITA to store the reference images of male and female wing patterns taught by Pierre in a database in the computer of Gershman ... with a reasonable expectation of success”; “It would have been obvious to a POSITA to use the computer of Gershman to compare the image with the database of reference images of male and female wing patterns in order to determine the sex of the chick, as taught by Pierre, with a reasonable expectation of success”); 28 (“It would have been obvious to store a collection of reference images in a database to organize the collection of reference images”; “[i]t would have been obvious to a POSITA that the camera of Yavnai is in communication with a computer processor having the database of reference images so that an image captured by the camera can be processed in the computer processing method taught by Pierre to determine the sex of a chick with a reasonable expectation of success”), 29 (“Claims 1, 6 and 7 of the '124 patent would have been obvious under 35 U.S.C. § 103 over Pierre in view of Goodwin”), 31 (“It would have been obvious to a POSITA to

replace the manual chick sexing station of Goodwin with the automated chick sexing station of Pierre by placing Pierre's image capture device at the upper end of Goodwin's conveyor 18 and capturing an image of each chick when it drops off the end of the conveyor in order to further automate the Goodwin system and reduce the number of personnel required to perform chick sexing with a reasonable expectation of success"; "it would have been obvious to communicate with the image capture device"), 32 ("[i]t would have been obvious to store a collection of reference images in a database to organize the collection of reference images"); 33-34 ("[i]t would have been obvious to a POSITA to replace the manual chick sexing station of Goodwin with the automated chick sexing station of Pierre by placing Pierre's image capture device at the end of Goodwin's conveyor 18 and capturing an image of each chick when it drops off the end of the conveyor in order to further automate the Goodwin system and reduce the number of personnel required to perform chick sexing with a reasonable expectation of success"); 34 ("it would have been obvious to communicate with the image capture device"; "[i]t would have been obvious to store a collection of reference images in a database to organize the collection of reference images."; "[i]t also would have been obvious to a POSITA to include reference images for chicks of the same breed to make the comparison to the images of the chick meaningful"); 35 ("It would

have been obvious to a POSITA that comparison of an image of the chick with reference images can reveal a deviation between the image and the reference images”; Claims 1, 6 and 7 of the ’124 patent would have been obvious under 35 U.S.C. § 103 over Pierre in view of Gershman.), 36-37 (“[i]t would have been obvious to use the moving plate of Gershman as the means of causing the chicks to fall and reflexively open their wings for imaging and subsequent sex determination in the Pierre system”); 38 (“[i]t would have been obvious to store a collection of reference images in a database to organize the collection of reference images”); 39 (“It would have been obvious to use the moving plate of Gershman as the means of causing the chicks to fall and reflexively open their wings for imaging and subsequent assessment of the health of the chick as in the Pierre system”); 40 (“It would have been obvious to store a collection of reference images in a database to organize the collection of reference images”; “It is understood in Pierre that the computer processor is in communication with the image capture device or, at the very least, that it would have been obvious to communicate with the image capture device.”); 41 (“[i]t would have been obvious to a POSITA that comparison of an image of the chick with reference images can reveal a deviation between the image and the reference images”); 42 (“It would have been obvious to a POSITA to use a computer control unit as in Tao as a master control unit in

the Pierre/Goodwin system to communicate with a conveyor, image capture device, and processor in the system in order to efficiently control the system.”); 43 (“It would have been obvious to a POSITA to use the routing system taught by Tao to remove a chick from the Gershman plate according to a deviation of the chick.”); 44(“It would have been obvious to a POSITA to use a computer control unit as in Tao as a master control unit in the Gershman/Pierre system to communicate with a moving plate, image capture device, and processor in the Gershman/Pierre system in order to efficiently control the system”; “It would have been obvious for a POSITA to include a removing device in the system of Gershman/Pierre/Tao so that the chicks can be removed and sent to the appropriate location in the system after their gender has been determined.”); 46 (“It would have been obvious to a person of ordinary skill in the art move the Gershman plate supporting the chick using the springs to facilitate removing the chick into the appropriate area corresponding to the determined sex of the chick.”); 48 (“[i]t would have been obvious to store a collection of reference images in a database in order to organize the collection of reference images”; “[i]t would have been obvious to a POSITA to store the reference images of a predetermined feature taught by Pierre in a database in the computer of Gershman as an alternative or additional means of analyzing the image of the chick to determine the sex of

the chick with a reasonable expectation of success.”); 49 (“[i]t would have been obvious to a POSITA to compare images taken in the Gershman system as modified by Pierre to determine deviations from the database of reference images (e.g., which chicks did not correspond to an image of a particular sex”) in order to sort the chicks into appropriate groups”); 50 (“It would have been obvious to a POSITA to move the movable plate supporting the chick in the Gershman/Tao system at an angle to facilitate removing the chick into the appropriate area corresponding to the determined sex of the chick. Choosing to have the movable plate at an angle is merely a design choice that depends on the elevation of the two endpoints in the system.”); 51 (“Thus, it would have been obvious to a POSITA to design the system of Gershman to include the removing means of Tao such that the processor would instruct the removing of the chick from the Gershman moving platform”); 52 (“[i]t would have been obvious to a POSITA to use the reference images of a particular breed to ensure that the reference images include the sex-based differences in feather patterns that are specific to the breed”); 53 (“It would have been obvious to a POSITA to determine the sex of a chick based on a variance using Gershman and remove the chick based on its sex using the routing system of Tao with a reasonable expectation of success”; “It would have been obvious to a POSITA to alter the position of the Gershman plate supporting the chick

to facilitate removing the chick into the appropriate area corresponding to the determined sex of the chick”); 54 (“It would have been obvious to a POSITA to place the source of the electrization proximate to the moving platform”); 55 (“It would have been obvious to a POSITA to use a computer control unit as in Tao as a master control unit in the Yavnai/Pierre system to communicate with a conveyor, image capture device, and processor in the system in order to efficiently control the system.”), 59 (“It would have been obvious to store a collection of reference images in a database to organize the collection of reference images”; “It would have been obvious to a POSITA to store the reference images of male and female wing patterns taught by Pierre in the computer system of Yavnai, which would necessarily be in communication with the image capture device, in order to determine the sex of the chick with a reasonable expectation of success”); 60 (“It would have been obvious to a POSITA to compare images taken in the Yavnai system as modified by Pierre and look for deviations from the database of reference images (e.g., which chicks did not correspond to an image of a particular sex) in order to sort the chicks into appropriate groups with a reasonable expectation of success”; “It would have been obvious to a POSITA to move the Yavnai conveyor supporting the chick at an angle to facilitate removing the chick into the appropriate area corresponding to the determined sex of the chick as proposed

by Tao”); 61 (“[i]t would have been obvious to a POSITA that the camera of Yavnai can transmit an image to a computer processor having the database of reference images so that the image can be compared with reference images in the computer processing method taught by Pierre to determine the sex of a chick with a reasonable expectation of success”); 62(“Thus, it would have been obvious to a POSITA to design the system of Yavnai to include the removing means of Tao such that the processor would instruct the removing of the chick from the Yavnai conveyor”), 64 (“It would have been obvious to a POSITA to use an angled conveyor having a downward incline to cause successive chicks to fall and open their wings on their own, as taught by Pierre”; “[i]t also would have been obvious to a POSITA to use an angled conveyor having a downward incline as an unstable surface to cause a chick to jump and spread its wings, as taught by Yavnai”; “[i]t would have been obvious to a POSITA that an angled conveyor of claim 16 would form an angle with the horizon”; “[i]t would have been obvious to a POSITA to angle a conveyor between 0 and 90 degrees to the horizon in order to achieve an angled conveyor having a far end lower than a near end or an angle with the horizon as discussed above for claims 16 and 17”).

57. In addition to being unsupported, in my opinion, Petitioner’s obviousness arguments are inaccurate. They fail to address the challenges and

realities of industrial poultry processing that were present at the time of the alleged invention, and what incentives were in place to achieve certain objectives. For example, in my opinion the POSITA would not have any motivation to modify the primitive, manually movable plate of Gershman to integrate it into Pierre's industrial poultry processing system (or any other industrial system). This is because a POSITA would understand that rapid movement of chicks is critical in an industrial system, and bottlenecks caused by a manually movable plate that has to be lowered and raised for each chick would create an unacceptable bottleneck in an industrial context. Pierre makes clear in several instances that its system is for use in "industrial breeding" centers. Ex. 1004 at Abstract, 4, 5. In my opinion, a POSITA would have known that industrial breeding centers process chicks at an extremely high throughput rate. *See, e.g.*, Ex. 1006, 3:1-11 (automated operations achieving up to twelve chicks per second). In my opinion, a POSITA would not have been motivated to integrate the manually movable plate of Gershman into an industrial system precisely because to do so would drastically reduce the extremely high throughput rate which industrial breeding centers achieve and seek to improve.

58. In my opinion, in contrast to a system suitable for industry (*see* IV.A.1 *supra*), Gershman discloses an experiment in which a human puts a

chick on a stationary plate, one chick at a time. A POSITA would have understood that implementing Gershman in a processing facility would require adding the movable plate device of Gershman (processing one chick at a time, in a vertical direction) in the middle of a high-throughput system (processing upwards of 10 chicks a second). A POSITA would realize this would create a bottleneck because chicks would need to wait for their turn on the movable plate, and this would be entirely unworkable in the industrial system of Pierre. In other words, Gershman would introduce a full stop in any lateral conveyance system, effectively pausing the lateral conveyance of the chick so that a sexing process can be completed, but only in a vertical direction. That is, Gershman's system only leverages the vertical direction for its sexing operation, meaning that there are no gains in the lateral routing/sorting direction the chick ultimately needs to be moved in. This would introduce a great deal of lag into any industrial hatching system, and a POSITA would not have had any motivation to combine Gershman and Pierre for at least that reason.

59. In addition to the bottleneck issues, in my opinion, a POSITA reading Gershman would instantly realize the numerous other problems inherent to the system resulting from Gershman combined with any other prior art reference to achieve a solution pertinent to the 2015 timeframe (and

thereafter), and the POSITA would understand the system of Gershman is not workable in any industrial system in the 2015 (or post-2015) timeframe. For example, a POSITA would realize that because Gershman's plate accommodates only one chick at a time, they would need to figure out how to ensure that only one chick is loaded on the plate in Step 1 – otherwise, pictures of multiple chicks would mean that chicks cannot be accurately sorted. A POSITA would have also realized that with Gershman they would need to find a way to ensure (in Step 2) that chicks do not fall down the drop shaft as they wait. However, a POSITA would have understood that even if an opening/closing door is used, it would only create a further problem of how to ensure the fragile chicks are injured by the closing door.

60. A POSITA would further realize that if chicks were to be held in a holding area to wait for their turn on the manual platform of Gershman, there would be a problem with chick droppings building up on the platform or holding area. In my opinion, a POSITA would understand that accumulation of chick droppings would be particularly problematic for Gershman because Gershman requires a clean transparent plate that is illuminated, and which serves as a backdrop against which to capture images of the chick from above the movable plate. Gershman does not address or even acknowledge these problems, and similarly does not provide a solution to them. In my opinion,

a POSITA would have understood that Gershman did not provide such solutions precisely because Gershman is limited only to a simple experimental set up used by the author, and represents more of a proof-of-concept paper than a viable solution for chick sexing in a real-world industrial setting.

61. In my opinion, Petitioner also fails to show any motivation or a reasonable expectation of success in combining Yavnai with Pierre. As I discuss in further detail below, in my opinion a POSITA would know that Yavnai does not even work because it requires highly restraining the chick to take an image, which drastically increases the chances of injuring the fragile chicks (which is exactly the problem the '124 solves). Accordingly, in my opinion a POSITA would not be motivated to use Yavnai at all, much less combine with a system like Pierre that would not address the fundamental issues with Yavnai.

62. For these reasons and the additional ones I discuss below, in my opinion the claims of the '124 patent are patentable.

V. THE '124 PATENT

A. Overview

63. I have reviewed the '124 patent, and understand that it relates to systems for quickly and efficiently inspecting day-old chicks to determine, in one embodiment, their gender and health without manual intervention. *See*

Ex. 1001 at 2:20-24. The system uses a series of moving platforms (e.g., conveyor belts) such as conveyor belts that support the chick as it is brought through a process of being stimulated to cause its wings to open and be imaged for purposes of determining its sex, its health and/or other characteristics of interest. *See id.* at 2:27-3:16. The '124 patent system makes humane, high-throughput poultry processing possible in a way that had never been seen in the prior art at that time.

64. As illustrated in one embodiment in Figure 6, the chick is supported by a moving platform (38) as it is stimulated and imaged:

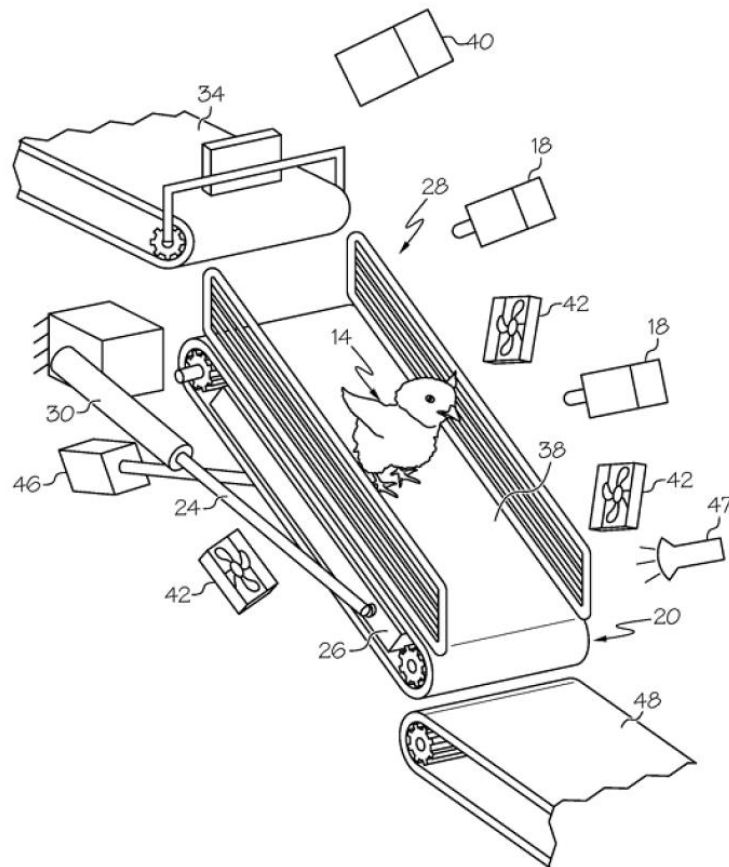


FIG. 6

Id. at Fig. 6.

65. The '124 patent does not contemplate a process were the chick is unsupported by the moving platform as it is stimulated and/or imaged.

66. The '124 patent invention solved several major problems in the poultry industry. Each relates to speed, accuracy, and/or safety in connection with sorting young chicks (*e.g.*, day old chicks). *See id.* at 1:14-3:16. If the sorting process is too slow, makes too many errors, requires too much manual handling or manipulation of the chicks, results in injury to the chicks (which can be caused by, *e.g.*, over handling), efficiency suffers and of the welfare of the chicks (including with respect to preventing the spread of disease) may be compromised. Prior to the '124 patent, there was no system that addressed all of these problems and met all of these needs.

67. In my opinion, the '124 patent presents an elegant solution to address these problems. A representative claim is shown below:

1. A system for determining the sex of a chick comprising:
a moving platform to support an unrestrained chick of a particular breed;
at least one stimuli to cause the chick to open its wings;
an image capture device to capture at least one image of the chick; and
a computer processor having a database of images of male and female wing patterns for the particular breed, the computer processor in communication with the image capture device, whereby the image capture device captures at least one image of the chick and transmits it to the computer processor where

the image is processed and compared to the database to determine the sex.

Id. at 6:54-67.

68. As reflected in this claim, the '124 patent claims a unique solution that combines features to enable, in one embodiment, the rapid and accurate determinations of a chick's gender. The "moving platform" keeps the chicks moving and continually progressing through the processing facility without stopping for manual inspections that can both slow down processing and increase mortality rates because of potential injuries to the chick during handling. *See id.* As any POSITA would have known, baby chicks are inherently fragile. Both manual handling and restraint systems present a risk to the health of baby chicks and POSITAs have long understood the need to innovate beyond such systems to reduce the risk of injury.

69. Critically, the '124 patent makes clear that the "moving platform" is designed to support an "unrestrained chick," which reduces the risk of injury that may occur by restraining a chick. *See, e.g., id.*, 2:8-18; 6:55-56, 7:19-20, 42-43. With the '124 patent, the "stimuli" can be imposed upon an "unrestrained chick," and the "image" captured is of the same "unrestrained chick." By proceeding through the sexing, health evaluation, or other inspection process "unrestrained", the chick is not physically

manipulated or otherwise inspected in a manner that increases the likelihood of injury or disease.

70. In the claimed systems of the '124 patent, the “stimuli” and “image” capture and processing all occur while the chicks are supported on the “moving platform,” and as such the chicks can be moved in a controlled manner. This means that sexing, health inspection, and/or feature inspection, can occur continuously while chicks are being transported on a moving conveyor system, and the outcome of the inspection process can inform the sorting/removal of the chicks as they progress through the conveyor system.

71. Accordingly, in my opinion the '124 patent provides an elegant system that achieves a unique solution that (i) emphasizes speed of processing, (ii) avoids the harmful manual inspection and restraint, (iii) reduces the likelihood of causing injury or disease, and (iv) at the same time provides the accuracy needed to avoid mis-sorting chicks on the basis of an incorrect assessment of sex and/or health status. *See id.* at 1:14-3:16. Before the '124 patent, no viable solution achieving all of these objectives had been proffered.

B. Prosecution History of the '124 patent

72. I have reviewed the prosecution history of the application that led to the '124 patent. Ex. 1002. Based on my review of the prosecution

history, I understand that the '124 patent issued on October 20, 2020 from an application filed on May 11, 2018, U.S. Patent Application No. 15/775,706 (the "'706 Application"). Ex. 1002 at 1, 261. The '706 Application was a national stage entry of PCT Application No. PCT/US2016/061536 (the "PCT Application") filed years earlier, on November 11, 2016. *Id.* Further, the PCT Application itself claims priority to two underlying provisional applications – U.S. Provisional Application No. 62/349,981, filed on June 14, 2016, and U.S. Provisional Application No. 62/254,737, filed on November 13, 2015 – which likewise extends the priority claim of the '706 Application to those dates. Ex. 1002 at 521. For purposes of this declaration, I have been asked to assume a priority date of November 13, 2015 (the "Critical Date")⁶.

73. On October 18, 2018, the Applicant submitted an Information Disclosure Statement ("IDS") that identified twenty-five (25) prior art references for the Examiner's consideration. See Ex. 1002, pages 263-267. The IDS identified Gershman, Yavnai, Goodwin, and Tao (four of the references relied upon by Petitioner), and provided citations to the sections of

⁶ I note that while I have been asked to assume November 13, 2015 to be the Critical Date, if I were to apply either June 14, 2016 (the date of a later filed provisional application) or November 11, 2016 (the date of the associated PCT application), or May 11, 2018 (the filing date of the national-stage entry non-provisional application) as the Critical Date, the opinions I offer herein would remain the same.

Yavnai, Goodwin, and Tao, including some citations that the Petitioner also relied on in its Petition. *Id.*

74. On November 5, 2019, the Examiner issued an office action (“Office Action”). *Id.* at 203-230. The Office Action rejected claims 1-3, 7-10 and 21-34 as failing to comply with the written description and enablement requirements under 35 U.S.C. § 112(a). *Id.* at 211-217. Claims 1-3, 7-10 and 21-34 were further rejected as being indefinite under 35 U.S.C. § 112(b). *Id.* The Office Action further rejected original claims 9-10, 21, 24, 26 and 33-34 under § 102, and claims 1-3, 7-8, 22-23, 25, 27-32 under 35 U.S.C. § 102. *Id.* at 221-224.

75. The § 112 rejections focused on certain language in the original claims that concerned the “level of deviation of the image of the chick” and “process[ing] the images.” *Id.* at 211-217.

76. The § 102 rejection relied upon Tao as disclosing each limitation of original claims 9-10, 21, 24, 26 and 33-34. *Id.* at 221-224. The § 103 rejections relied upon combinations of Gershman, Yavnai, and Tao. *Id.* at 217-220, 224-228. The Examiner rejected original claims 1, 2, 3, 27-28 and 32 over Tao in view of Yavnai. The Examiner relied upon Tao as disclosing all of the limitations in claims 1-3, 27-28 and 32 except for those limitations

that related to “UV” or “strobe” lighting as a stimuli. *Id.* at 218, 225. For those limitations the Examiner relied upon Yavnai. *Id.* at 218-220, 225-226.

77. The Examiner also rejected original claims 7-8 and 31 over Tao in view of Yavnai, but also added Gershman into the combination with reference to the “database” limitation of the original claims, and contended that Gershman’s teaching to “use Microsoft Excel” to “build a graph of the relationship between [compactness and roughness values] and manually draw 2 polygons . . . and to place this data in memory of computer” satisfied that limitation. *Id.* at 220-221. Finally, the Examiner also rejected original claims 22, 23, 25, 29 and 30 over Tao in view of Gershman. *Id.* at 226-228.

78. Of relevance to the later response and amendment by the Applicant, in each of its § 102 and 103 rejections the Examiner relied upon Tao as disclosing the “a moving platform to support a chick” language in all of the original claims. *See e.g.*, Ex. 1002 at 223.

79. On February 5, 2020, Applicant responded and amended the claims to clarify distinctions over Tao, Yavnai, and Gershman. *Id.* at 183-201. The amendments clarified that the “moving platform” was not so broad as Examiner was initially interpreting it. Not only did the platform have to be actually “moving,” but it had to “support” an “unrestrained chick.” *See* Ex. 1002, pages 184-185. The Applicant’s amendments also clarified that the

“database” was not just any database with any images at all, it was “a database of images of male and female wing patterns for the particular breed.” The amendments to the independent claims are shown below:

1. (Currently amended) A system for determining the sex of a chick comprising:
a moving platform to support an unrestrained chick of a particular breed;
at least one stimuli to cause the chick to open its wings;
an image capture device to capture at least one image of the chick;
~~a database having a library of digital images; and~~
a computer processor having a database of images of male and female wing patterns for the particular breed, the computer processor in communication with the image capture device and the database, whereby the image capture device captures at least one image of the chick and transmits it to the computer processor where the image is processed and compared to the database to determine the sex ~~the computer processor calculates a level of deviation of the image.~~

9. (Currently amended) A system for determining the health of a day old chick comprising:
a moving platform upon which an unrestrained chick is supported positioned;
image capturing device to capture at least one electronic image of the chick ~~on the moving platform~~;
~~a database containing electronic images of healthy and unhealthy chicks within the chick's breed;~~

computerized image processor in communication with the image capture device, the computerized processor having access to a database of images of healthy and unhealthy chicks of the same breed, whereby the image capture device captures at least one image of the chick, and it is transmitted to the computerized image processor where the computerized image processor compares the at least one image of the chick to the database of images to detect ~~determines the level of~~ a deviation from the database of images of the image of the chick.

21. (Currently amended) A system of sorting chicks on the basis of a predetermined feature of a chick comprising:
a moving platform to support an unrestrained chick;

an image capture device positioned proximate to the moving platform to capture at least one image of the chick as it passes on the moving platform;
a computer processor in communication with the image capture device, the computer processor having a database of images of a predetermined feature of a chick therein, the computer processor capable of processing images and determining deviation from the database of images ~~a predetermined value~~; and
removing means for removing a chick from the moving platform, the removing means in communication with the computer processor, whereby when the image capture device takes an image of the chick and transmits it to the computer processor, the computer processor processes the image and determines ~~the level of any~~ any deviation of the image from the database of images ~~chick's predetermined feature~~, ~~if the level of a deviation is detected exceeds a predetermined value~~, the computer processor communicates with the removing means to remove the chick from the moving platform.

Ex. 1002 at 184-188.

80. On February 28, 2020, Applicant participated in an interview with the Examiner, and discussed a proposed Examiner's amendment to address 112 rejections. Ex. 1002 at 133-134.

81. On March 6, 2020, the Examiner issued a Notice of Allowance setting forth the Examiner's amendment discussed during the February 28, 2020 interview. *Id.* at 119-132. In the reasons for allowance, the Examiner noted that the closest prior art of record (Tao, Yavnai, and/or Gershman) did not disclose, teach or suggest the independent claims, including a "moving platform upon which an unrestrained chick is supported." (emphasis in original). *Id.* at 130.

82. On April 23, 2020, the Examiner issued a miscellaneous communication to applicant indicating an error in the application data sheet with respect to a PCT filing date. *Id.* at 112-114.

83. On June 4, 2020, the Applicant submitted an Information Disclosure Statement. *Id.* at 48-51. On June 5, 2020, the Applicant paid the issue fee. *Id.* at 44-47. On June 10, 2020, the USPTO issued a notice of non-compliance of the June 4, 2020 Information Disclosure Statement because it lacked the accompanying fee. *Id.* at 42. Applicant petitioned to withdraw from issue on June 16, 2020, and also re-submitted its Information Disclosure Statement, along the missing Information Disclosure fee, but the petition was dismissed on June 22, 2020. Ex. 1002 at 28-41.

84. The Examiner issued on June 23, 2020 a further Notice of Allowance, which did not list additional reasons for allowance. *Id.* at 16-17.

85. On September 18, 2020, Applicant re-submitted an October 18, 2018 Information Disclosure Statement at the Examiner's Request. *Id.* at 10. On September 23, 2020, the Examiner issued a further Notice of Allowance, referencing a September 18, 2020 interview, and which did not list additional reasons for allowance. *Id.* at 4-7.

86. On September 30, 2020, the USPTO mailed the issue notification, and the '124 patent issued on October 20, 2020. *Id.* at 1.

VI. OVERVIEW OF CITED ART

87. Below, I discuss in further detail the references that the Petitioner relies upon.

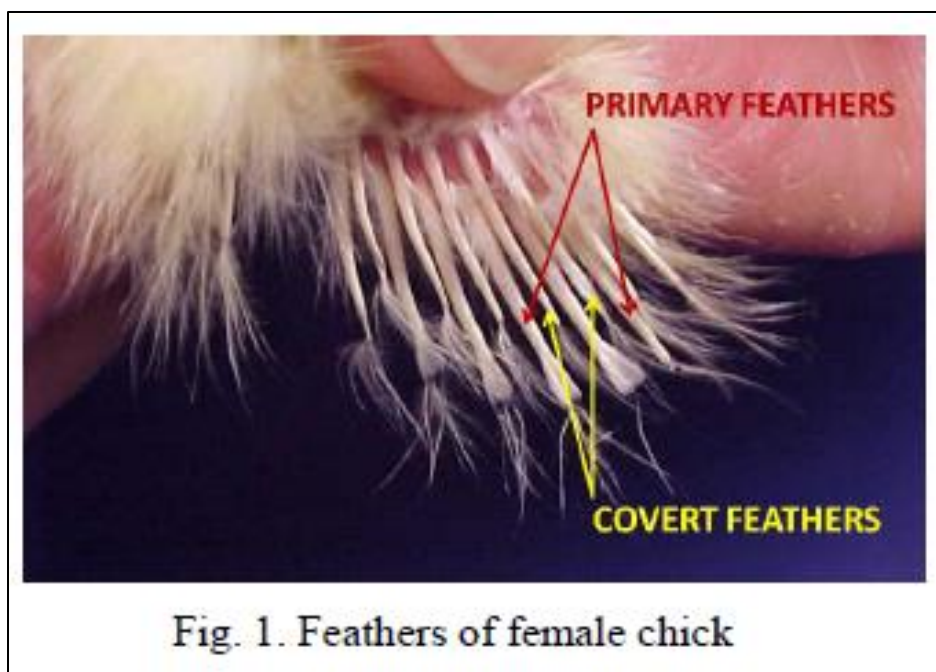
A. Gershman

88. Gershman is a paper a POSITA would view as a concept paper or a high level proof-of-concept document that is light on many details. Gershman discloses an incomplete sexing solution that requires chicks to be placed one at a time into a situation where it is in free fall such that it will open its wings. The Gershman paper describes experiments with a potential method for chick sexing using a rudimentary manual drop plate and photography set up. Gershman takes a photo during the chick's wings free fall, and then looking at differences in plumage sprouts (as a distinguishing feature between male and female chicks within the first days after hatching) to determine sex.

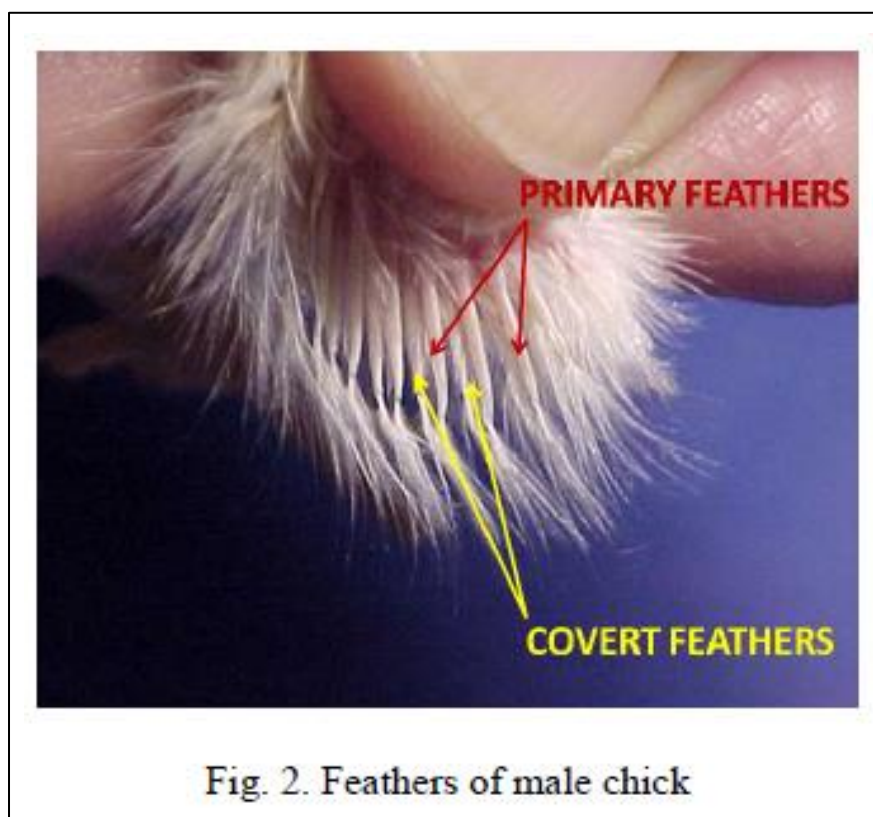
89. The author himself acknowledges that his concept is not fully developed, and explains that it essentially describes the mere "possibility to develop cheap computerized optical separator for determining the sex of one-day chickens." Ex. 1003, 1. Gershman acknowledges that he presents solutions that are "unlikely to find a practical application." *Id.*, 10. For the handful of solutions Gershman supposes could have some practical

application, Gershman admits that “the described information” is “only the beginning” and “need[s] a lot of efforts [sic]” before it could be adopted. *Id.* at 10. Furthermore, the Gershman paper ends with a plea for a strategic partner to develop his nascent ideas. *Id.* at 10 (“[we] will be happy to find strategic partner”). Based on my work and research in the field, Gershman’s experimental prototype was never developed or implemented for industrial application.

90. Gershman describes taking a picture of a chick with its wings open and using that to determine gender. As its title indicates, Gershman refers to some “basic principles” known in the art and related to determining the sex of one-day old chicks. *Id.* For instance, it refers to the fact that male and female chicks have different plumage (i.e., flight feather sprouts on male and female feathers) within the first days after hatching, and notes that these differences can be used to determine the sex of a chick. *Id.* It was already known in the prior art that male and female chicks have different plumage (i.e., flight feather sprouts on male and female feathers) within the first days after hatching, and these differences can be used to determine the sex of a chick. Gershman provides some photos of the plumage differences between male and female chicks.



Id. at Fig. 1.



Id. at Fig. 2.

91. Gershman then describes taking a picture of a chick with its wings open and using that to determine gender, and provides a method of analyzing the wing image to determine sex. In large part, Gershman's method requires the chick's wings to be open while the picture is being taken.

92. To cause a chick to open its wings so that the wings can be imaged, Gershman proposed to place a chick on a plate, drop the plate from beneath the chick at a rate "a little more than free-fall acceleration" and "down more speedy than the acceleration of free fall (g)"— quickly enough that the chick's "legs should lose support faster than they can move down." *Id.* at 3. That is, the plate moves downward quicker than both (1) gravitational force, and (2) the speed at which the chick's legs would move down" reflexively in an attempt to press against anything beneath them when the support is removed. *Id.* Gershman's plate was at least partially transparent (made from "milk-white plastic PVC") and was illuminated by a white light from below (using a "led white light source"), as depicted in Figure 3 below (which is notably not a picture of an entire assembled system).



Fig.3 Chick on plate. Light radiates from the bottom

Id. at Fig. 3.

93. Gershman proposes that while the chick is in free-fall, the system can “take pictures of chicks with open wings by simple cheap digital camera with white backlight.” *Id.* at 2-3. Pictures are taken from above the chick, which is illuminated from beneath it, as shown in Figure 5 below. As noted above, the plate is at least partially transparent and allows some visible light to pass through and provide illumination. Gershman’s photo depicts the chick against a clean transparent backdrop, which a POSITA would understand is a necessary requirement to achieve accuracy in the image analysis – e.g., the plate must be clean enough to permit illumination, so as not to corrupt background of the image and complicate image processing.

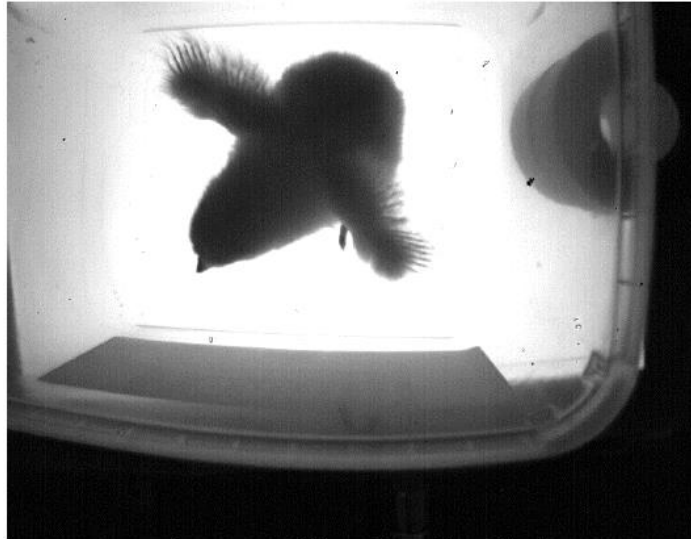


Fig. 5. Falling female chick

Id. at Fig. 5.

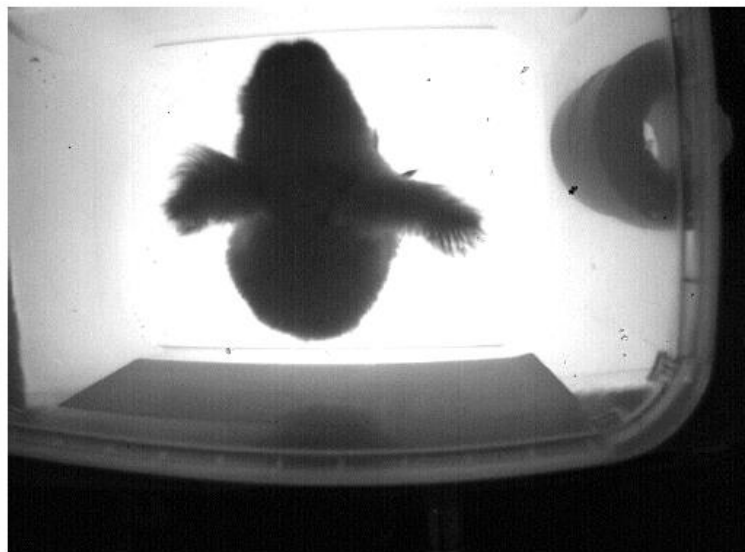


Fig. 6. Falling male chick

Id. at Fig. 6.

94. Once an image is captured, Gershman's method of image analysis does not involve any comparisons between the images taken and any other reference image(s), but instead identifies "blob[s]" and looks at the

relationship between “compactness” and “roughness” of a chick’s wing using virtual polygons as reflected in some of the images below:

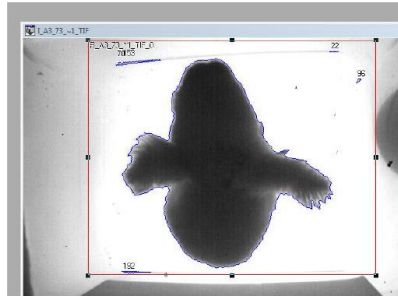


Fig.7 Internal blob of image of falling chick ("Threshold" = 200)

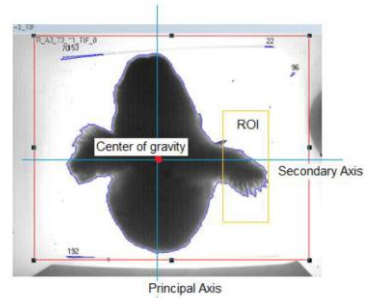


Fig. 8. Designation of ROI

Id. at Fig. 7-8.

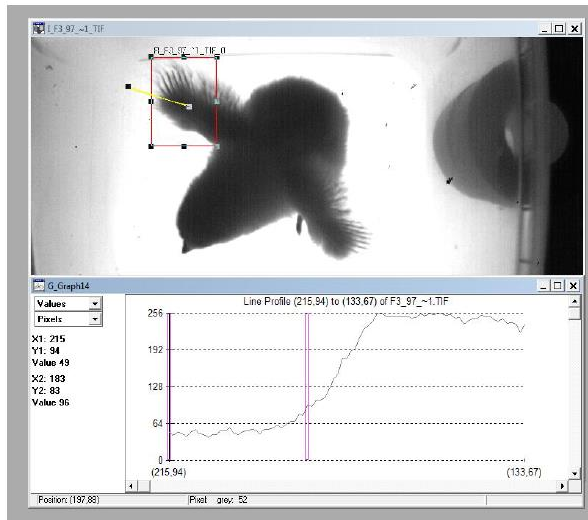


Fig.9 Determination of value of threshold of external contour (in this sample: 96)

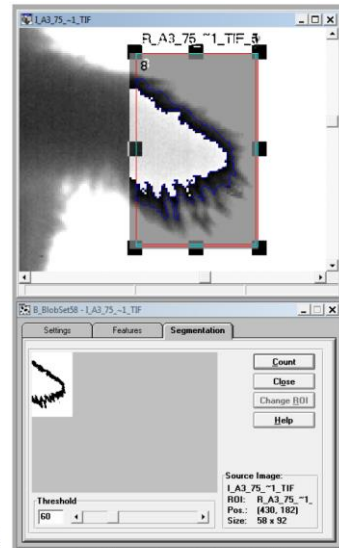


Fig.10 Analyzed area (ROI) of the chick

Id. at Fig. 9-10.

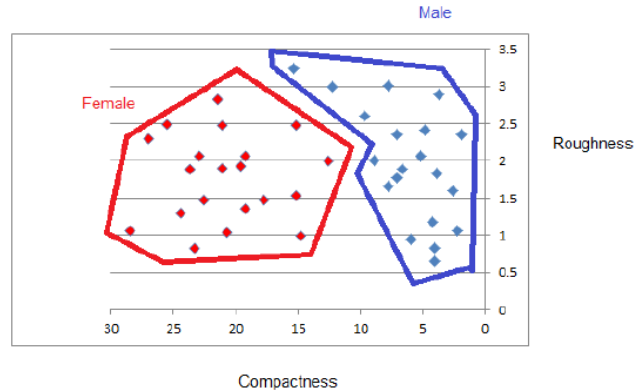


Fig.11. Virtual polygons of sorting parameters (Relation between "Compactness" and "Roughness" for 1 stage – learning)

Id. at Fig. 11.

B. Pierre

95. Pierre provides an incomplete description of a system for the examination of bird plumage to identify characteristics of the bird, including sex. Pierre's system, like Gershman's, requires that each chick be placed "one at a time" into a situation where it is falling such that it will open its wings. Ex. 1004, 4. Pierre does not disclose any mechanism for how the chick would be made to fall, but just says to do it (without any meaningful explanation or directions). *Id.*, Abstract, 3. During the fall, Pierre teaches that a camera takes one or more pictures of its wings, one of which will be compared with plumage in a single "reference" image. Pierre proposes "using reflective vision measuring" and "implementing lighting from above and a camera vertical to the place of the fall" for this purpose (the opposite orientation

proposed in Gershman). *Id.*, 4. Notably, Pierre provides no details on how this could be successfully achieved, but just says that it should be done.

96. Pierre does recognize, however, the difficulty in capturing an image of the chick at just the right time during the fall where the chick has opened its wings the optimal amount. *Id.*, 7. The camera must be optimized “such that the image captured for image processing may be optimal for comparison with a reference image useful for each specific application.” *Id.*, 5. Pierre suggests “detecting the wing span by optical means particular to this measurement in order to control a digital image capture set to the optimal span.” *Id.*, 5. Pierre suggests this should be done on an individual basis rather than merely by capturing an image either (i) after the same duration of fall time for each chick, or (ii) at the same vertical distance on its downward trajectory from the point it begins its fall. *Id.*, 4.

97. The picture captured is then compared to a single “reference image.” Ex. 1004, 5. Pierre teaches that in some cases many pictures of the chick can be taken during its fall, and then the one that comes closest to the reference image can be chosen for purposes of the image analysis. *Id.*, 7. However, Pierre does not disclose any database of images of male and female wing patterns to compare the captured image against to determine sex.

C. Yavnai

98. Yavnai includes a brief three page disclosure referring to various systems for inducing a chick's wings to spread, including by physically forcing them to open using different devices, restraining the wings in that position, and then taking an image of the wings once they are in the restrained position. Ex-1005 at *passim*. In one alternative, the chicks are placed in a funnel shaped device that forces the chicks wings into the desired position. *Id.* at [0037]-[0040].

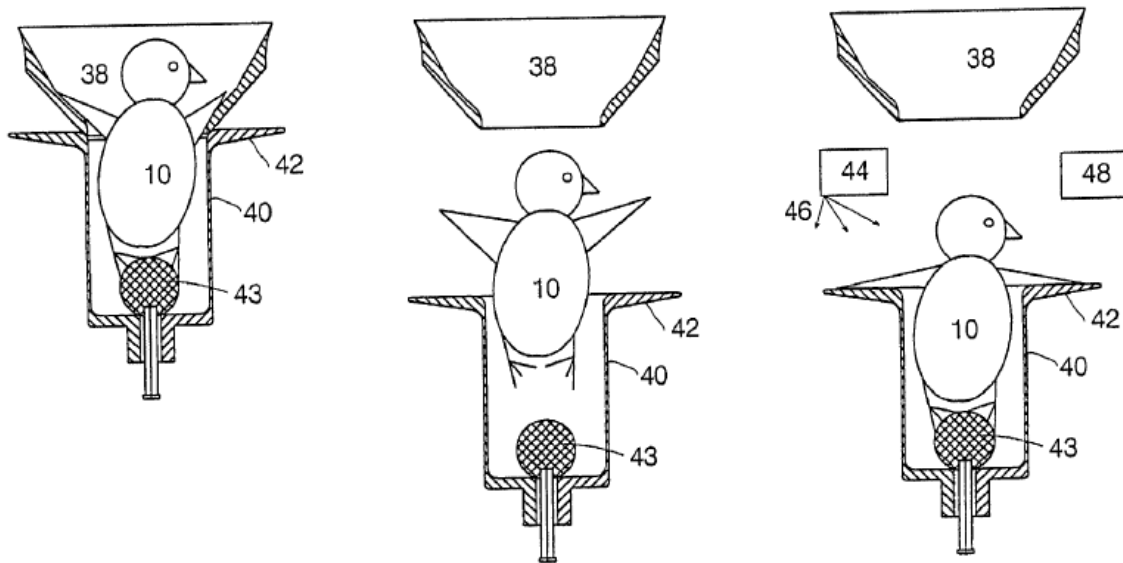


FIGURE 4

Id. at Fig. 4.

99. In another alternative, the one Petitioner relies on in its challenge, the chicks are placed on a flat conveyor belt having a vibrating mechanism that causes the chicks to jump up and spread their wings. See Ex-1005 at

[0042], Figs. 5A-5B. As shown in Figures 5A-B, and as a POSITA would understand, when the chick is placed on the conveyor belt, the poles immediately restrain the chick's feet and legs laterally, thereby restricting the chick's lateral movement so that the chick remains in alignment for the angled poles to restrain the chick's wings. At the point where the chicks spread their wings, Yavnai's intent is that the angled poles will prevent the wings from closing, and then progressively force the chick's wings into a further extended position as the chick proceeds down the conveyor. *See id.* The conveyor and angled poles are shown in Figure 5A, and the desired position with the poles having forced the wings into a fully open position is shown in Figure 5B.

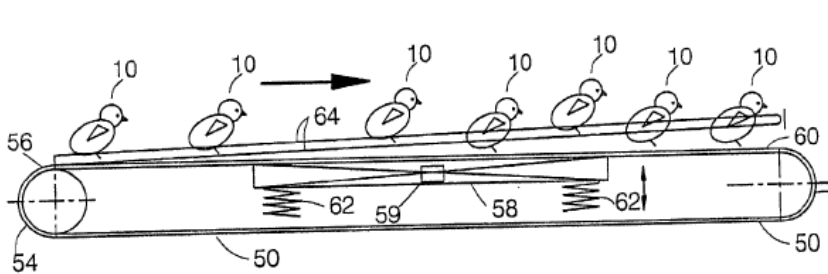


FIGURE 5A

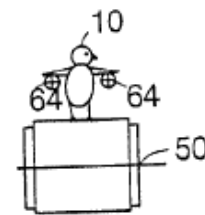


FIGURE 5B

Id. at Figs. 5A-5B.

100. In other alternatives, Yavnai discloses other systems that similarly force chick's wings to open (e.g., top edges 69 and 74 of surfaces 71 and 72 support the spread wings of chick in Figs 6A-6B, where chick is bounded on two sides by electrically conducting surfaces 76 and 77). *See, e.g.*, EX-1005 at [0043]-[0044] Figs. 6B, 7B.

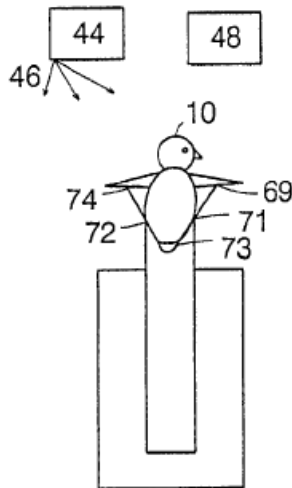


FIGURE 6B

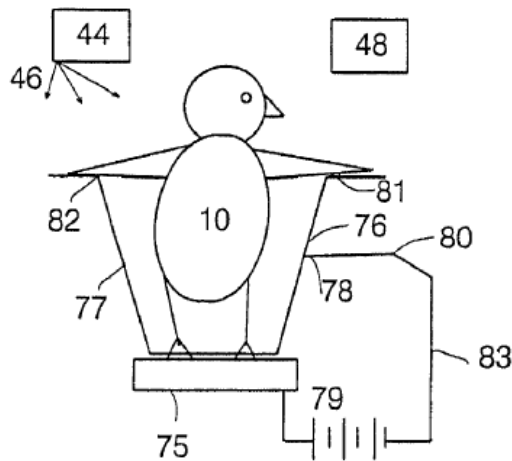


FIGURE 7B

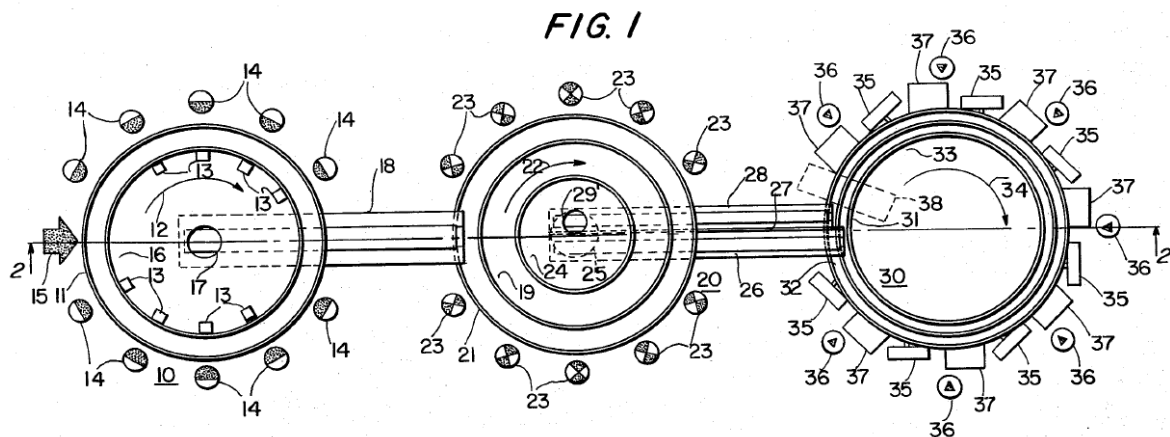
Id. at Figs. 6B, 7B.

101. With specific reference to Figures 5A-5B that the Petitioner relies upon, a POSITA would have understood that because the chicks must be highly restrained by poles and their wings must be manipulated in order for the Yavnai system to work, the risk of injury to the chick is greatly increased as the chick is moved forward against the poles and held in place. As a POSITA would have understood, chicks are delicate and putting them into a situation where they experience progressively more restraints as they proceed down a conveyor system risks damaging their wings or crushing the chicks altogether.

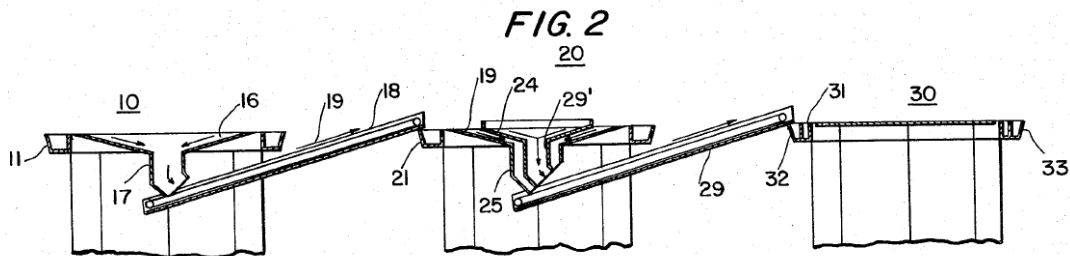
D. Goodwin

102. Goodwin discloses a conveyor system with various stations where manual inspections or other operations take place – each chick goes

through these stations. Ex. 1007 at 1:48-52, 2:18-33. For example, the first station is a debeaking station, the second is a vaccination station, and the third is a sexing station. *Id.* at 1:48-52. At the sexing station, Goodwin discloses dropping the chicks onto an annular conveyor trough, which rotates the chicks past various points where human sexing operators are stationed. *Id.* at 2:18-33. A human sexing operator in turn removes each chick from the trough and determines the sex of each chick through known manual inspection techniques.



Id. at Fig. 1.



Id. at Fig. 2.

E. Tao

103. Tao discloses the use of UV lighting instead of regular lighting when imaging chick wings for sexing. *See* Ex-1006 at Abstract, 2:37-51. Tao applies UV lighting instead of regular lighting to more effectively distinguish between down and feather structures – Tao describes UV lighting as more effective because a “strong signal ratio between feather and down” makes it “much easier for the consequent image processing without sophisticated noise removing process . . .” *See id.* at 2:37-51. Tao observed that a typical hatching operation in 1999 would produce roughly 250,000 – 500,000 baby chicks a day that need to be sexed and sorted as quickly as possible. Given industrial requirements, Tao recognized the need for sexing and sorting systems to provide “higher throughput,” “labor savings and cost benefits” and “fewer human errors.” *See id.* at 1:57-2:17.

VII. PERSON OF ORDINARY SKILL IN THE ART

104. I understand that patentability must be analyzed from the perspective of “one of ordinary skill in the art” in the same field as the ’124 patent at the time of the invention. The relevant time of invention is the patent’s priority date, which, as I noted above, is taken to be November 13, 2015 for purposes of this declaration.

105. I also understand that several factors are considered in assessing the level of ordinary skill in the art, including (1) the types of problems encountered in the art; (2) the prior art solutions to those problems; (3) the rapidity with which innovations are made; (4) the sophistication of the technology; and (5) the education level of active workers in the field.

106. In my opinion, a person of ordinary skill in the art relevant to the '124 patent at the time of the invention ("POSITA") would have had a Bachelor of Science degree in agricultural, industrial, and/or electrical engineering and two years of work or research experience in the fields of automated capital equipment, industrial poultry sexing, and/or image processing. More formal education may substitute for less work or research experience, and vice versa.

107. I surpass this definition of one of ordinary skill in the art now and at the priority date of the '124 patent; however, my analysis regarding the '124 patent has been based on the perspective of a person of ordinary skill in the art as of the priority date of the '124 patent.

108. I am also familiar with the knowledge of the person of ordinary skill in the art as of the priority date of the '124 patent. I am able to opine on how the person of ordinary skill in the art would have understood the disclosure and claims of the '124 patent, the disclosures of the prior art, any

motivation to combine nor not combine the prior art, and what combinations would and would not have been obvious to one of ordinary skill in the art with a reasonable expectation of success.

109. I understand that my definition of the level of ordinary skill in the art is higher than that of the Petitioner. See Pet., 15-16. Accordingly, I qualify as a person of ordinary skill in the art under Petitioner's definition as well, and my opinions apply with equal force under both definitions.

VIII. CLAIM CONSTRUCTION

110. As I discussed above, I have been informed that for purposes of *inter-partes* reviews, the standard for claim construction of terms within the claims of the patent is the same as that applied in federal district court litigation. I have been asked to assume that the claim terms otherwise have their plain and ordinary meaning to a person skilled in the art in light of the specification and the prosecution history.

111. In my view, the claims are straightforward to a POSITA, and a POSITA could reasonably ascertain the scope and meaning of the claim language without formal constructions. Thus, as of this time, I am not aware of any term that requires specific construction for my opinions.

112. That said, based on my review of the '124 patent and the Petitioner's characterizations of both the '124 patent and the prior art, the

plain and ordinary meaning of certain terms in the '124 patent appears to have been misunderstood by Petitioner. In particular, it appears that the claim language was not evaluated from the perspective of a POSITA, and some corrections and clarifications are needed. The limitations where this appears to be the case include the following: “moving platform to support an unrestrained chick” (recited in claims 1 and 9), “moving platform upon which an unrestrained chick is supported” (recited in claim 6). More specifically, the terms that warrant further discussion include: “moving platform,” “to support”, and “unrestrained chick” as claimed (recited in claims 1, 6 and 9). I discuss these terms below. My opinions apply under either of the parties’ proposed constructions.

A. “moving platform to support an unrestrained chick” (Claims 1 & 9) and “moving platform upon which an unrestrained chick is supported” (Claim 6)

113. Each independent claim of the '124 patent includes limitations that involve a “moving platform” that “supports” an “unrestrained chick.” More specifically, claims 1 and 9 recite a “moving platform to support an unrestrained chick” and claim 6 recites a “moving platform upon which an unrestrained chick is supported.” See Ex. 1001 at 7:54-67, 7:17-32, 7:40-8:16. These limitations recite exactly what the claimed “moving platform” has to do – it has to support an unrestrained chick. The individual terms of this claim

cannot be considered in isolation, they must be considered from the perspective of a POSITA in the context of the limitation as a whole, as well as in the context of the claim as a whole. In my opinion, the plain and ordinary meaning of these terms as it would be understood by a POSITA is: “a platform in motion supporting an unrestrained chick as it transports the chick from a first location to a second location.”

114. In my opinion, Petitioner appears to have viewed the claims incorrectly, perhaps because they did not consult a POSITA, or an expert that could speak to the perspective of a POSITA. Consequently, Petitioner appears to ignore the entire limitation and the context of the other claim language and the specification, and instead heavily focuses on the term “moving platform” in isolation, divorced from the larger phrase in which the term appears. Consequently, Petitioner arrives at an interpretation of “moving platform” that only contemplates “a platform that transports a chick from a first location to a second location.” *Id.* at 16 (citing Ex. 1001, 3:62–67). This is a partial characterization of what the claimed “moving platform” does, but a POSITA would view it as being incomplete in the full context of the claim and specification. Instead, from the perspective of a POSITA at the time of the invention, the “moving platform” does not just transport a chick from a first

location to a second; it also *supports the unrestrained chick*. The express language of the claims confirms this, and so does the specification.

115. With its construction, Petitioner also ignores that the verbatim claim phrases are “moving platform to support an unrestrained chick” (claims 1 and 9) and “moving platform upon which an unrestrained chick is supported” (claim 6) – both of which incorporate the express requirement of support. From the perspective of a POSITA at the time of the invention, and in the context of the claims as a whole and the specification, the plain and ordinary meaning of these terms is “a platform in motion supporting an unrestrained chick as it transports the chick from a first location to a second location.”

B. “moving platform” (Claims 1, 6 and 9)

116. As discussed above, in my opinion a POSITA would not interpret “moving platform” in isolation from the rest of the entire claim and the specification. Instead, a POSITA would understand the term in the full context of the phrases in which it appears. However, even if “moving platform” was construed in isolation, I disagree with Petitioner’s proposed plain meaning of “a platform that transports a chick from a first location to a second location” – this proposed plain meaning is incorrect because it does not include the express requirement of “moving.” A POSITA would

understand that a “moving platform” is, quite simply, a “platform that is *in motion*.” As I mentioned above, the patentee specifically chose to use a verb—moving—in this term. The patentee did not choose to use the terms “configured to move,” “movable,” or a platform that can be “moved upon” or “moved over”. *Moving* is an active term as used in the claims, not a passive one as Petitioner’s interpretation permits.

117. A POSITA would understand a “moving platform” to be *in motion* on account of at least the claim language itself, as I’ve explained above, and also because that understanding is supported by the specification of the ’124 patent. The ’124 patent specification very clearly depicts and describes a system where the moving platform (a conveyor belt) is in *motion* supporting and transporting the chick through the system. This can be seen, and would be understood as such by a POSITA, from the figures provided in the ’124 patent, some of which I have reproduced below.

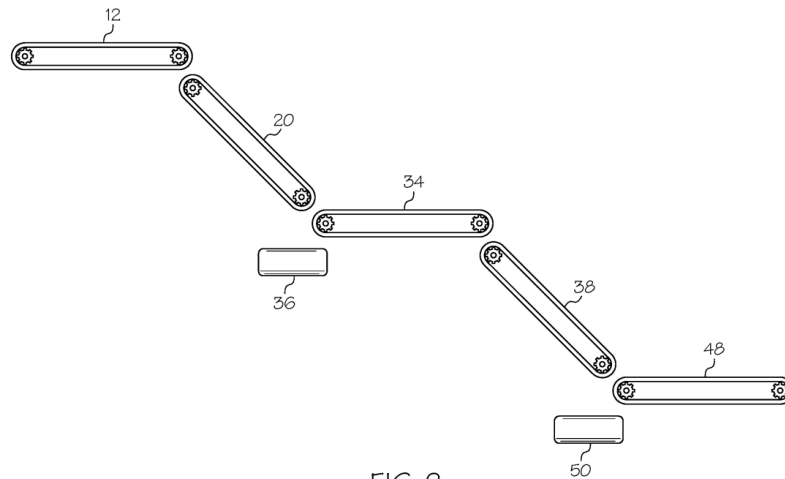


FIG. 2

Ex-1001 at Fig. 2.

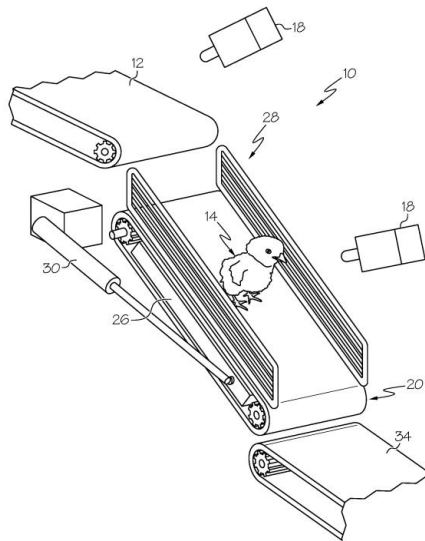


FIG. 3

Ex-1001 at Fig. 3.

118. A POSITA would have understood, and common sense confirms, that a *stationary* platform, or movable platform, is not a *moving* platform. In my opinion, Petitioner's interpretation incorrectly broadens the

term “moving platform” to encompass platforms that are stationary while supporting an unrestrained chick so long as they are “movable” at some point in the process (even if during the time of actual movement they do not support the unrestrained chick). For example, if a chick is imaged while sitting on a stationary plate that is merely capable of moving, I understand Petitioner’s position is that the chick is having its image taken on a moving platform. I see no support for such a broadening in the express claim language (which recites the active verb “moving” not the broader term “movable”), or in the specification where no stationary platform embodiment is disclosed.

C. “unrestrained chick” (Claims 1, 6, 9)

119. All of the independent claims require the moving platform to provide support to “an unrestrained chick.” *See* Ex-1001 at 7:54-67, 7:17-32, 7:40-8:16. In the claimed system an “unrestrained” chick is supported by the moving platform, and the chick can move forward, backward, left, right, it can rotate, and it can jump and flap its wings. The chick is free to move its body and wings as it naturally can while on the moving platform. Unrestrained chicks are illustrated in several of the figures provided in the ’124 patent, including those I have reproduced below.

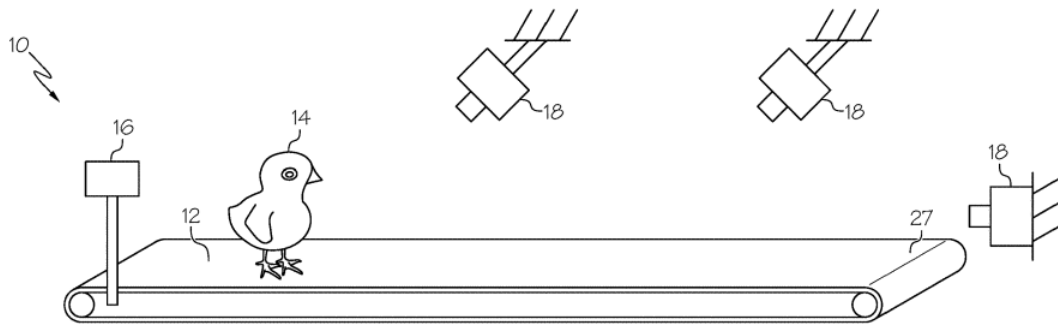


FIG. 1

See Ex-1001 at Fig.1.

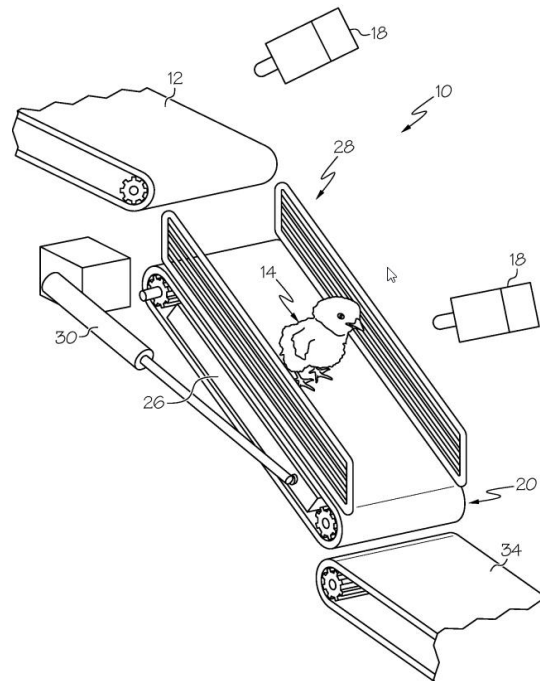


FIG. 3

See Ex-1001 at Fig.3.

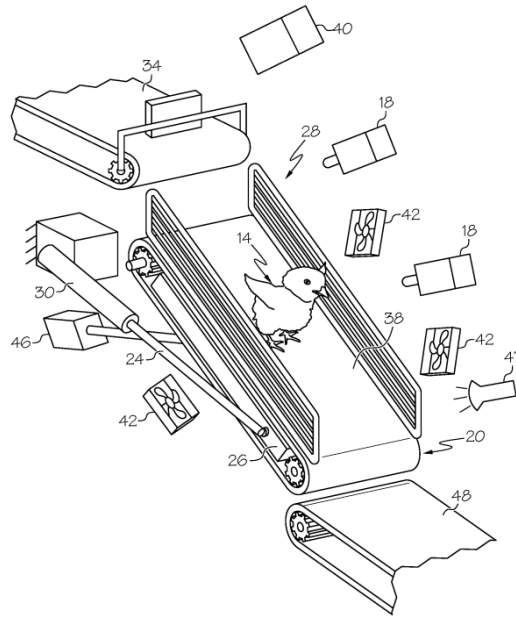


FIG. 6

See Ex-1001 at Fig.6.

120. As a POSITA would have understood from at least these figures and the related description—even with the “pair of rails 28” (which are offset from the chick’s position and only there to “prevent the chick from falling off of the [moving platform])—no part of the chick’s body is being restricted from its natural movement by the rails. Instead, in each of the above illustrations in the ’124 patent, a POSITA would understand the chick is free to move its body and wings as it naturally can while on the moving platform.

121. Petitioner’s interpretation would require “unrestrained chick” to mean a chick that can “freely move its wings while on the moving platform.” Pet., 19. But, in my opinion, this definition improperly requires only the *wings* be free to move, ignoring the rest of the chick’s body. A POSITA would

understand that such a definition leads to nonsensical results because they are inconsistent with the claims and the specification. As an example, a chick could have its feet locked down in place by shackles on the platform yet still be “unrestrained” under Petitioner’s interpretation because its wings can move. A POSITA would immediately reject this interpretation. The claims do not recite a “chick with unrestrained wings” – they recite an “unrestrained chick.” Moreover, the specification discloses a chick whose whole body, not just its wings, is free to move on the moving platform. Accordingly, in my opinion a POSITA would understand the plain meaning of “unrestrained chick” is a chick that can freely move its body, including its wings, as it naturally can while on the moving platform.

IX. OPINIONS

122. In my opinion, Petitioner’s obviousness arguments fail for two main, independent reasons. None of the proffered combinations disclose all the limitations of the independent claims (claim 1, 6, and 9) as would be required to make a prima facie case of obviousness. And a POSITA would not have been motivated to make the combinations presented, nor had a reasonable expectation of success in doing so.

A. The Proffered Combinations of Prior Art Fail to Disclose All Limitations of the Independent Claims

1. Gershman (Grounds 1, 4, 6-7)

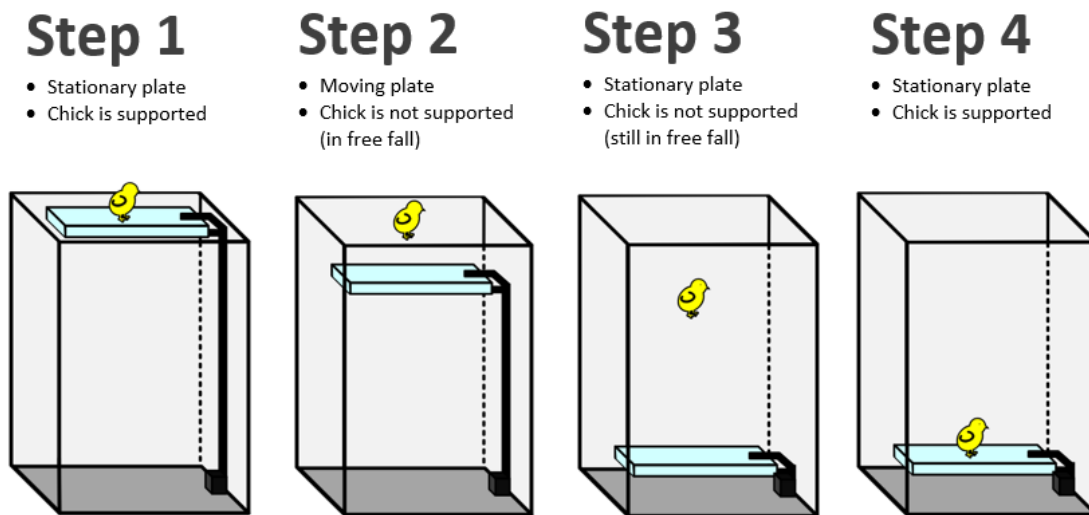
123. Petitioner relies on Gershman in Grounds 1, 4, 6-7 as allegedly disclosing the limitations “a *moving platform to support* an unrestrained chick” (claims 1 & 9) and “a *moving platform* upon which an unrestrained chick *is supported*” (claim 6). This is incorrect. I understand that it is undisputed that none of the other references Petitioner attempts to combine with Gershman (Pierre for Grounds 1 and 4; and Pierre and Tao for Grounds 6-7) disclose this limitation. Because Gershman fails to disclose the moving platform to support an unrestrained chick limitations, all of Petitioners obviousness arguments for Grounds 1, 4, and 6-7 fail because their proffered combination does not include all of the elements of the challenged claims.

i. Gershman Does Not Disclose the “moving platform to support an unrestrained chick” Limitations of Independent Claims 1 & 9 or “moving platform upon which an unrestrained chick is supported” Limitation of Independent Claim 6

124. As I addressed above, this claim element requires the platform to *support* the chick when the platform is in *motion* (i.e., moving). However, as a POSITA would realize, the Gershman drop plate is the opposite of “a moving platform to support an unrestrained chick.” Instead, the plate of

Gershman is specifically designed **not to support** the chick because the chick is in free fall while the plate is moving.

125. In Gershman, the chick is initially supported by a movable plate that is entirely stationary, as illustrated in the below demonstrative. Ex. 1003, 3.



That plate is then set in motion and drops out from under the chick so quickly that the chick falls (*i.e.*, is not supported) (Steps 2-3). *See id.*, 2-3. The chick then lands on and is supported by the plate at the very bottom of the drop shaft (Step 4), but only when the plate is entirely stationary again. *See id.* Accordingly, the only time the movable plate in Gershman could ever be considered to be a “moving” plate, it is specifically designed **to not support** the chick. Conversely, the only time Gershman’s movable plate supports the chick is when it is not a moving platform at all, but rather an entirely stationary

plate. A POSITA would understand that in Gershman, there is no platform that is both “moving” and providing “support” to the unrestrained chick as required by the claims, such that there is no “moving platform to support an unrestrained chick”.

126. A POSITA would have further understood that Gershman’s teaching of an unsupported chick during the plate’s movement is critical to its operation. Gershman places the chick in unsupported free-fall in order to take an image of the chick with its wings open.

127. As a POSITA would have understood, this unsupported free fall is critically distinct from the claimed moving platform “to support” an unrestrained chick. The free fall of Gershman cuts against one of the key benefits of the ’124 patent system, because ensuring that chicks are *supported* on a *moving* platform through the sexing and evaluation allows for a fast, efficient, and controlled process. In contrast, Gershman’s plate would create a backlog of chicks awaiting their turn on the chick-dropping platform, accommodating only one chick at a time, and creating an unacceptable bottleneck for an industrial system.

128. I note that the claims do not say that the platform is merely “movable”, The claims instead say that the platform is “moving” while also providing “support” to an “unrestrained chick.” Ex. 1001, 6:55-56. Such a

“moving” platform in the form of a conveyor belt is shown for example in Figure 3 of the ’124 patent. Interpreting this claim element to require only that the platform be “movable” at some point during operation, and independently to require that it “support” the chick at some point during operation, is at odds with how a POSITA would interpret the claim. The plain language of the claim requires that the platform be actually “moving” while providing “support” to an unrestrained chick—not just be “movable” at any point during operation, totally untethered to when the plate provides “support” to the chick. Ex. 1001, 6:55-56. As a POSITA would know, in industrial poultry processing, a high rate of throughput—*moving* the chicks quickly—is critical. And as the ’124 patent specification makes clear, the series of moving platforms that support an unrestrained chick cause the chick’s wings to open and allows the chick’s wings to be photographed for purposes of determining its sex and/or its health. *See id.*, 2:27-3:16. As a POSITA would have appreciated, this makes for quicker sexing decisions, and renders possible a more humane, high-throughput poultry processing.

129. Accordingly, a POSITA, consistent with the claim language, the specification, and the file history, would have understood that the claims require a platform that is “moving” while also providing “support” to an “unrestrained chick.” A POSITA would have similarly understood that

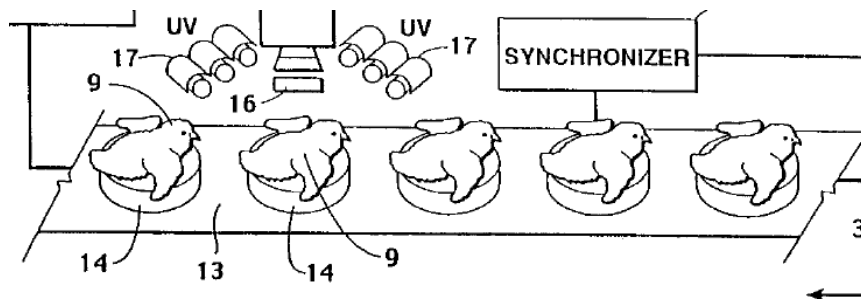
Gershman does not disclose such a limitation. In my opinion Gershman also does not meet this limitation for a second reason. Both parties' proposed plain meanings for the term "moving platform" include a requirement that it "transports the chick from a first location to a second location," but Gershman's platform does not do this. Instead, in Gershman it is the removal of the plate and gravity that transport the chick from a first location to a second location. Consider a person holding a baseball in his or her hand at shoulder level. If the person pulls his or her hand out from under the ball and catches the ball at the hip level, one would not consider the hand to have "transported" the ball from the first location to the second location—rather it was the removal of the hand and gravity that transported the ball. In my opinion, the same is true with Gershman's platform – the platform does not transport the chick, gravity alone does that.

130. The prosecution history further confirms this deficiency of Gershman, as explained in further detail below.

ii. The Prosecution History Confirms Gershman Does Not Disclose the "moving platform to support an unrestrained chick" Limitations

131. I understand that during prosecution, the Examiner extensively cited and discussed Gershman. Ex. 1002, 129-130, 220-221, 226-228, 562, 565. However, I understand that the Examiner never contended that

Gershman's drop plate could be a "moving platform to support an unrestrained chick." *See id.* This makes sense because, as I've noted, that is simply not what Gershman's plate does. Instead, I understand the Examiner appears to have assumed and adopted the plain meaning of this term as a POSITA would have understood it, insofar as the platform must be both "in motion" and "supporting" the chick. Indeed, the Examiner consistently cited only the Tao reference as disclosing the moving platform to support a chick. In Tao, as can be seen below and as a POSITA would understand, the chicks are indeed in motion and supported through the process (though they are restrained):



Ex. 1006, Fig. 1.

132. I understand that in its Institution Decision, the Board faulted the Examiner for "never discuss[ing] that Gershman also teaches a moving platform supporting an unrestrained chick"—but as I explained above, in my opinion, Gershman does *not* disclose this limitation under the plain meaning of the term as a POSITA would have understood it, and as the Examiner

appears to have understood it in allowing the claims over Gershman and Pierre. ID, 11-12.

iii. Response to Institution Decision (“ID”) Regarding Gershman

133. At the institution phase, I understand that the Board found that Gershman disclosed “a moving platform to support an unrestrained chick of a particular breed” based on what is in my opinion an erroneous understanding of Gershman’s figures 3, 5, and 6. ID, 17. Specifically, the Board noted that “Gershman Figures 3, 5, and 6 show a chick supported on a ‘moving plate’ and moving from a first location to a second location via a mechanical activator as argued by Petitioner.” *Id.* In my opinion, this contrary to Gershman’s teachings. Indeed, as I explained above, a POSITA would understand that Gershman never discloses a chick supported on a plate that is actually moving (e.g., none of Gershman’s figures show a chick supported on a plate that is actually moving).

134. For example, as shown in Figure 3, which I reproduced below, Gershwin shows a plate supporting a chick. As is visible in Figure 3, and as a POSITA would understand, this is a stationary plate held by a hand, not a moving plate, that is supporting the chick:



Fig.3 Chick on plate. Light radiates from the bottom

Id., Fig. 3.

135. The image of Figure 3 does not even show the experimental system of Gershwin in its entirety. Instead, as a POSITA would have understood, the photo conveys that a light radiates from the bottom up through the plate and simultaneously provides a “white” backdrop against which a black and white photo would be preferably taken from above the chick. Ex. 1003, 3, 5.

136. As shown below, Figures 5 and 6 of Gershman show more of the system, although not a complete system, and illustrate either mechanical actuator (or perhaps a simple support) to the right of the chick:



Fig. 5. Falling female chick

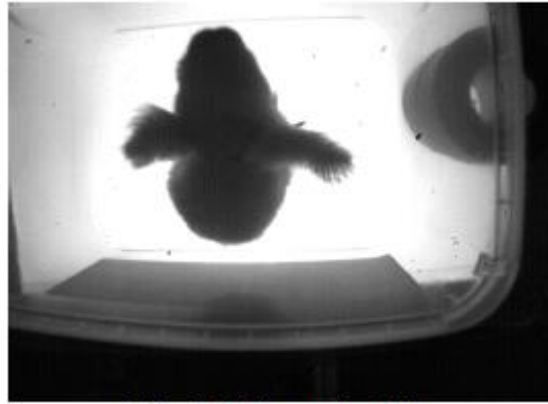


Fig. 6. Falling male chick

Id., Figs. 5, 6.

137. Again, as shown in both Figures 5 and 6, and as a POSITA would have understood, the photos in Gershwin are taken from a top view that shows the wings open **while the chick is unsupported**. *Id.*, Figs. 5, 6. Figures 5 and 6 are labeled “Falling female chick” and “Falling male chick,” respectively. As a POSITA would realize, these figures do not show a moving plate providing any support to the chick at all when in motion. Instead, a POSITA would understand the chicks are in free-fall as indicated by the Figs. 5-6 labels (“Falling female chick” and “Falling male chick”) and the written description, which confirms the plate *intentionally* does not provide any support while moving. *See id.*, 3, 5, 10. Gershwin’s disclosure states that when the chick’s wings are open, the plate is moving downward at a rate that is faster than gravitational acceleration. *See id.* Specifically, Gershwin states that the plate is “falling with acceleration more than **g**,” and that the plate

moves “down more speedy than the acceleration of free fall (**g**).” *Id.*, 3, 10 (emphasis in original). Accordingly, a POSITA reading this disclosure in Gershwin would understand that the plate moves downward faster than gravitational acceleration – meaning the chick is in free fall and unsupported by the plate.

138. If the plate moves downward at a rate that is more than the rate of gravitational acceleration, a POSITA would understand the only “support” the plate could potentially provide is if the chick’s legs, feet, or claws were to reactively jolt downward faster than the rest of the chick’s body was moving downward under the force of gravity, and thereby gain at least some nominal support from the moving plate. However, a POSITA would also recognize that Gershman specifically designed the system to avoid any such even minimal support. Specifically, Gershman teaches that the plate purposefully falls faster than this reactive ability of the chick. *See* Ex. 1003, 3. (“[a]s we observed in our fast filming, reaction of chicken libs [sic] irritation occurs very quickly, approximately 30-40 msec. If we assume that, the claws can pubescent [sic] 10 mm and this movement is uniformly accelerated, can be calculated that, acceleration of plate must be equal to 12-15 m/sec²”). *Id.* In other words, a POSITA would have understood that Gershman already accounted for any potential reactive ability of the chick. Furthermore, a

POSITA would have realized that Gershman teaches away from having the plate support the chick during free-fall because it indicates that “in order to secure the symptoms of reflex opening of the wings ***legs should lose support faster than they can move down.***” Ex. 1003, 3 (emphasis added).

139. I understand in its ID, the Board rejected the argument that Gershman fails to teach the claimed “moving platform to support an unrestrained chick” because the chick is supported only when the movable plate is stationary as “rely[ing] on an implied claim limitation that does not appear to be supported” by the intrinsic evidence. ID, 17. I respectfully disagree, at least because the express claim language recites the chick “is supported” by the “moving platform” (claim 6) and that the “moving platform” is “to support” the chick (claims 1 & 9). Even if the as-written claim language does not itself make this clear (which it does, and would be to a POSITA), in my opinion the intrinsic record clears up any ambiguity. As I noted above with respect to the prosecution history, I understand that Gershman was thoroughly vetted by the Examiner, and that after several amendments the Examiner determined that the claims were differentiated from Gershman (and as well as other prior art) in connection with this claim term. See Ex. 1002, 129 (“The closest prior art of record, namely, Tao . . . Yavnai . . . , and/or Yakov Gershman . . . do not disclose, teach or suggest,

a moving platform to support an unrestrained chick of a particular breed . . . as recited in independent claim 1.”).

140. Finally, I understand in its ID the Board noted that Patent Owner’s preliminary response “does not address Gershman’s teaching to add the moving plate system to the end of an industrial chick processing line, such as a conventional chick conveyor....” ID, 17 (emphasis added). Again, I respectfully disagree. As a POSITA would have understood, Gershman’s discussion of *how* his system could be allegedly integrated into an industrial setting simply confirms that any attempt to integrate Gershman into an industrial setting would have to address the multitude of problems I addressed above, such as bottlenecks, droppings rendering the images useless, how to ensure only one chick gets on the platform at a time, what happens to the chicks that are waiting. I note that Gershman includes a paragraph on a potential integration:

It will be necessary only simple modernization - to perform upgrading on their end - to add nodes lighting, electro optic unit, computer, moving plates with corresponding springs, activator, air ejectors for blowing chickens and appropriate bins.

141. However, in my opinion none of these modifications would solve the problems that a POSITA would recognize (bottlenecks, chick droppings rendering the images useless, how to ensure only one chick gets on the platform

at a time, what happens to the chicks that are waiting). In my opinion, a POSITA would simply understand Gershman to disclose adding his drop plate onto an industrial line, without specifying how, or how to address the problems associated with an industrial setting.

142. In my opinion, for the reasons discussed above, the drop plate system of Gershman is not a “moving platform **to support** an unrestrained chick” as required by the claims. Simply adding the drop plate of Gershman onto an industrial chick line does not change that fundamental failure. In my opinion, for at least the foregoing reasons, Gershman does not satisfy claim 1’s “moving platform to support an unrestrained chick.” In my opinion Pierre does not cure this deficiency of Gershman. Also, I understand based on my review of the Petition that the Petitioner does not contend that Pierre cures the deficiency of Gershman for any of the applicable grounds (Grounds 1, 4, 6, and 7). Accordingly, in my opinion the Gershman-Pierre combination does not render obvious any of the claims challenged in Grounds 1, 4, 6, and 7.

iv. Gershman Does Not Disclose the Additional Limitation of Dependent Claim 3

143. Dependent claim 3 of the ’124 patent requires “wherein the stimuli may be one or more of the following group: an angled conveyor, a vibrating conveyor, a strobe light, or a stream of air blowing on the chick.” Ex. 1001, 7:4-7. I understand that Ground 1 relies upon Gershman’s

disclosure concerning blowing compressed air on a chick to satisfy the “stimuli may be . . . [a] stream of air blowing on the chick” portion of the additional limitation recited in claim 3. Pet., 25.

144. As an initial matter, I understand that “the stimuli” of claim 3 finds antecedent basis in independent claim 1, which recites “at least one stimuli to cause the chick to open its wings.” Ex. 1001, 6:57-59. For the “stimuli” in claim 1, I understand Petitioner pointed to Gershman’s movable plate and argued that “the acceleration of the moving plate and the chick is a stimulus causing the chick to open its wings.” Pet., 22. Now, here for claim 3, I understand Petitioner improperly points to brand new “stimuli” without reference to claim 1. *Id.*, 25. Because the recited “stimuli” in claim 3 refers to the same “stimuli” introduced in claim 1, Petitioner’s new identification of “blowing compressed air on a chick” as the stimuli of claim 3 is insufficient because Petitioner has not shown how each and every element is satisfied—*i.e.*, how the newly identified “stimuli” also satisfies claim Element 1.2 for purposes of claim 3.

145. Moreover, in my opinion Gershman’s teaching of blowing compressed air at the chick has ***nothing to do with introducing a “stimuli to cause the chick to open its wings”*** as required by claims 1 and 3. Ex. 1003, 6. A POSITA would have understood that Gershman’s air-blowing is a

mechanism for pushing the chick off the plate after it has already experienced the fall and had its picture taken. Ex. 1003, 6. Specifically, Gershman states that “[o]ur tests also showed the possibility of blowing chick from a plate with compressed air (1.6 ATM) without any damage.” *Id.* Accordingly, a POSITA would understand that in Gershman, after the test was performed and picture was taken, “air ejectors for blowing chickens” could be used to move the chickens into “appropriate bins.” Ex. 1003, 4, 6. A POSITA would understand that this is not a “stimuli” to make the chicks open their wings to capture an image of them.

146. Accordingly, in my opinion Gershman does not disclose “wherein the stimuli may be one or more of the following group: an angled conveyor, a vibrating conveyor, a strobe light, or a stream of air blowing on the chick” as Petitioner proposed. In my opinion, even if a POSITA would have been motivated to combine Gershman and Pierre as proposed (they would not), the system that resulted from that combination would not satisfy each and every element of dependent claim 3.

147. To the extent Petitioner relies on Pierre to satisfy this limitation in Ground 3, in my opinion Pierre does not, at least because no “moving platform” of any sort is disclosed in Pierre. Pierre states that each chick is placed one at a time into a situation where it is falling such that it will open

its wings. Ex. 1004, 2. But Pierre does not disclose how the chicks get to that point in a process, much less a mechanism that would be practical in the industrial setting Pierre references. Ex. 1004 at Abstract, 3. Instead, Pierre is entirely silent and provides no disclosure, teaching, or suggestion to a POSITA regarding a moving platform.

2. Pierre (All Grounds)

148. I understand that Petitioner relies on Pierre as disclosing and rendering obvious, for all Grounds, the claimed “database of images” of various chick features to which the image of the chick is compared. But, Pierre suggests using just a single reference image for each chick being examined. Because of this, Pierre does not need, and does not even mention, a database of any type, or anything that could be considered equivalent thereto. Accordingly, I understand Petitioner does not dispute that all of the references it relies on (besides Pierre) do not disclose the claimed database. I understand that Dr. Karam addresses in her declaration why Pierre does not disclose such a database, and why accordingly all of Petitioner’s obviousness combinations fail because none of the cited prior art references disclose this limitation. Pierre also does not disclose a “moving platform” of any sort. Instead, Pierre states that each chick is placed one at a time into a situation where it is falling such that it will open its wings. Ex. 1004, 2. Pierre does not

disclose how the chicks get to that point in a process, nor does Pierre disclose a mechanism that would be practical in the industrial setting Pierre references. Ex. 1004 at Abstract, 3. Instead, Pierre provides no disclosure, teaching, or suggestion to a POSITA regarding a moving platform.

3. Yavnai (Grounds 2 & 8)

149. Independent claims 1 and 9 of the '124 patent require “a moving platform to support an *unrestrained* chick of a particular breed.” Ex. 1001, 6:55-56 (emphasis added). In Grounds 2 and 8, I understand that Petitioner relies on Yavnai alone as allegedly disclosing this limitation. In my opinion Yavnai does not disclose this limitation, and accordingly Petitioners Grounds 2 and 8 fail. Additionally, with reference to claims 16-18 (as to Ground 8 only), the Petition asserts that it would have been “obvious to a POSITA” to use an “angled conveyor,” which the Petition states are “taught by Pierre” and “taught by Yavnai.” Pet., 63-64. But neither Pierre nor Yavnai discloses angled conveyors whatsoever, and Petitioner points to nothing else for evidence that these would have been “well known” or obvious for purposes of achieving the solution of claims 16-18. *Id.* In my opinion, not only do Yavnai and Pierre lack these limitations, but Petitioner’s cited prior art more generally does not teach or suggest using an “angled conveyor” to stimulate a

chick to open its wings for imaging, and accordingly Petitioners Ground 8 fails for this reason also.

150. Returning to the “moving platform to support an *unrestrained* chick of a particular breed” limitations noted above with respect to claims 1 and 9 (and their dependents), in my opinion Yavnai fails to disclose the “unrestrained” limitation for two reasons, independent from one another. First, when the chick’s image is taken, which is a critical step in the process, Yavnai uses poles to keep the chick’s wings open and prevent them from closing, and to restrain the chick’s legs and feet in the lateral direction – which means the chick is restrained, not unrestrained. Ex. 1005, Abstract, [0042]. Second, the poles in Yavnai restrain the chick’s legs and feet in the lateral direction over the entire length of the moving platform. I discuss below both of the reasons why Yavnai does not disclose this element.

i. The Plain and Ordinary Meaning of “Restrain”

151. As an initial matter, I note that a POSITA would understand the word “restrain,” which is a simple word, to have a meaning of “to prevent from doing, exhibiting, or expressing something,” “to limit, restrict, or keep under control,” or “to moderate or limit the force, effect, development, or full exercise of.” Ex. 2005. Accordingly, in my opinion a POSITA would have understood that the angled poles of Yavnai restrain the chicks on the moving

platform: the poles initially keep the chicks under control by restraining their legs and feet to limit lateral movement and guide them along the platform in a defined narrow path; then, further along, the poles prevent the chicks from lowering their wings. As a POSITA would understand, the poles of Yavnai limit the full exercise of the chick's movement, they restrain the chick.

152. I understand that the Board in its ID appears to conclude that Yavnai's poles do not restrain the chick solely because Yavnai "uses the word 'support' rather than 'restrain'" in describing the poles. ID, 20-21. I respectfully disagree with this reasoning because – as a POSITA would know – the terms "support" and "restrain" are not mutually exclusive concepts, and in Yavnai the poles *both* support and restrain the chick. In my opinion, it is not necessary that Yavnai explicitly use the word "restrain." This is because a POSITA would understand that is exactly what the support poles of Yavnai do—they restrain the wing movement of the chick by supporting the chick's wings and forcing these wings to stay open.

ii. Yavnai's Poles Restrain the Chick at Precisely the Time the Claims Require That the Chick Be Unrestrained (During Imaging)

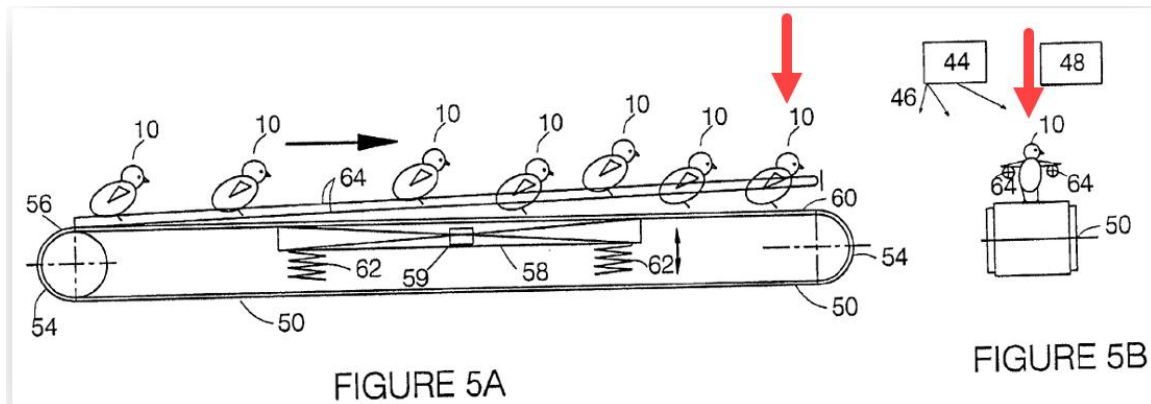
153. I understand that the claims require that the chick be unrestrained throughout the recited process, including when the chick is stimulated and when it is imaged. *See* Ex. 1001, 6:54-67. In my opinion this would be clear

to a POSITA, at least because claim 1 first recites a moving platform to support “***an unrestrained chick***,” and then goes on to recite that at least one stimuli causes “***the*** chick” to open its wings and an image capture device to capture at least one image of “***the*** chick.” *Id.* In my opinion, a POSITA would understand that the only basis for “the chick” that is stimulated and imaged is the “unrestrained chick” referred to earlier. *Id.* This is also consistent with the specification, which discloses that the chick is unrestrained throughout the stimulation and imaging process. A POSITA would understand from both the claims and the specification, that the chick is unrestrained throughout the entire stimulation and imaging process – not at some intervals or points along the process. I understand that the prosecution history further confirms this because Patent Owner distinguished the claimed system over prior art based on the claimed system “allow[ing] a chick to be moved unrestrained through the system.” Ex. 1002, 196. This confirms my opinion that a POSITA would understand claims 1 and 9 to require that the chick be unrestrained throughout the recited process, including when the chick is stimulated and when it is imaged.

154. In my opinion, in Yavnai, there would be no doubt for a POSITA that the chick’s wings are restrained in an open state. A POSITA would understand from the disclosure of Yavnai that the chick’s wings are restrained

in this open state at least from the point image of the chick is captured onwards. Figures 5A and B are reproduced below, with a red arrow indicating the point at which the chick is imaged – a POSITA would have understood from Yavnai that by the time the chick reaches that imaging point, it is already restrained in *two* ways (which point is shown below in Figures 5A-5B by the red arrows).

155. Figs. 5A-B are reproduced below:



Ex. 1005, Figs. 5A-5B

156. As shown in the above figures from Yavnai: first, a POSITA would understand that when it reaches the imaging point, the chick's body is restrained from lateral movement by the poles (64), which prevent its lateral movement on the platform from the start (56) to the end (60) of it. The POSITA would have realized that the Yavnai system has no side walls. Side walls, as in the '124 system, would allow chicks to be kept the moving platform while remaining free to move about. With this absence of side walls

in Yavnai, a POSITA would have understood that instead the narrow and constricting poles of Yavnai must be configured to restrain the chicks from lateral movement for the duration the chicks are on the moving platform. A POSITA would have understood this to be necessary to prevent chicks from falling off the moving platform. I understand Petitioner to effectively concede that the poles in Yavnai restrain the chick from lateral movement over the entire moving platform when it argues that “[t]he chick can also move backwards and forwards along the conveyor belt.” In my opinion, this is an implicit acknowledgement by Petitioner that the chick *cannot* move laterally due to the poles. Pet., 25.

157. The second reason a POSITA would have understood that in Yavnai by the time the chick reaches the imaging point, it is already restrained is because in Yavnai, the poles (64) restrain the chick’s wings to keep them in an open state at the point of imaging. A POSITA would have understood this from Yavnai’s disclosure that the poles support spread wings. Yavnai at Abstract (“two poles support[] the spread wings”); [0042] (“Poles 64 support the spread wings ...”). These poles in Yavnai are said to “support” the chick’s wings. Accordingly, in my opinion a POSITA would understand that they support the wings in an open state and prevent/restrict the chick from closing its wings to their closed position absent the poles. In my opinion, Yavnai’s

use of the term “support” poles confirms that there would be no need to “support” the wings in an open position unless the chick would otherwise potentially close the wings. Ex. 1005 at [0042]. In my opinion, a POSITA would have understood the poles to provide an upward supporting force preventing the chick from closing its wings while stimulated. This is because a POSITA would understand the support poles have no function other than to limit the movement of the chick’s wings and body and thus restrain them. Ex. 1005 at Fig. 5B. Accordingly, because the chick that is imaged in Yavnai is not an “unrestrained” chick, in my opinion Yavnai fails to meet this limitation.

158. I note that Petitioner appears to concede that at least by the end of the moving platform, when the chick is imaged, the chick *is* restrained. I have reproduced below an annotated depiction of Yavnai Figure 5A, which Petitioners had already annotated. Pet., 26. A POSITA would understand that the portion of the moving platform in the red box (annotated by Petitioner), is the portion *before* the poles plainly contact and restrict the movement of the wings. My understanding is that this red box area is the only area Petitioner contends is where the chick is “unrestrained”:

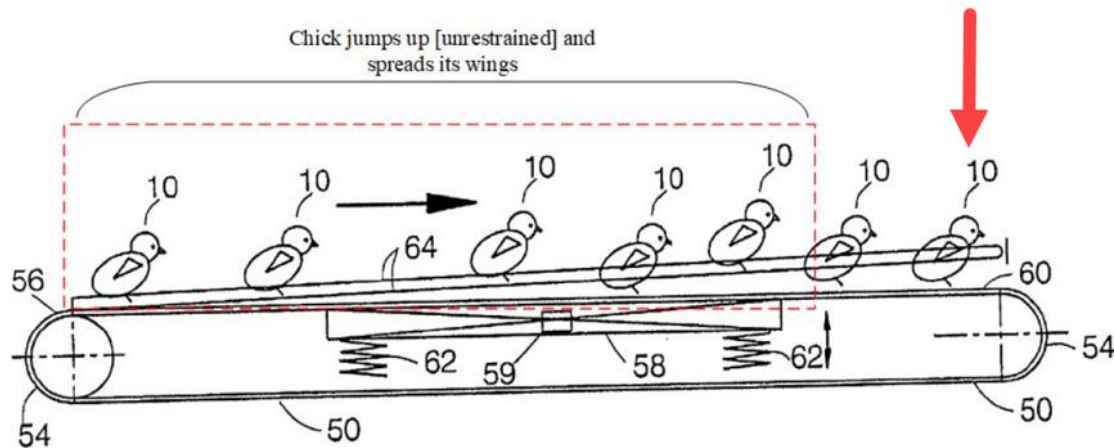


FIGURE 5A

However, as can be seen in the annotated Figure above, at the location where the chick is imaged (where I have added a red arrow), a POSITA would understand that the chick and its wings are clearly restrained by the poles. Moreover, even in the red boxed area shown in Fig. 5A, above, the chick is still restrained from lateral movement. Accordingly, in my opinion Yavnai fails to disclose the claimed moving platform to support an “unrestrained” chick.

159. I understand that Petitioner asserts the term “unrestrained chick” has the plain and ordinary meaning of “a chick that can ‘freely move its wings while on the moving platform.’” Pet., 19. I disagree – in my opinion this is not how a POSITA would understand the term “unrestrained chick.” This is because a POSITA would understand that by the time the chick reaches the imaging portion of the moving platform (the red arrow in annotated Fig. 5A

above), the poles are in the way and the chick cannot freely move its wings. In other words, at the imaging portion, the chick is on the moving platform but it cannot “freely move its wings.” Accordingly, in my opinion Yavnai fails to disclose this limitation even under Petitioner’s proffered interpretation of this term.

iii. Yavnai’s Poles Restrain the Chick Laterally Over the Entire Moving Platform

160. Even if the claims were understood to be met as long as the chick is unrestrained at some time (any time) on the moving platform – and in my opinion a POSITA would not understand them this way – Yavnai further fails to disclose this limitation. As I explained above, this is because in Yavnai the chick is restrained in the lateral direction over the entire length of the moving platform. As I explained above, a POSITA would have understood that the Yavnai system has no side walls which would keep the chick on the moving platform while still free to move about, as in the ’124 patent. Accordingly, a POSITA would have understood that the narrow and constricting poles of Yavnai have to be configured to restrain the chick from lateral movement for the duration the chicks are on the moving platform. Otherwise, as a POSITA would have realized, chicks would run the risk of falling off the moving platform, potentially harming the chicks and slowing down the process.

**iv. The Applicants Specifically Amended the Claims
to Add the “Unrestrained” Chick Limitation to
Distinguish Over Yavnai’s “Support” Poles**

161. I understand that the prosecution history further confirms that an “unrestrained chick” *does not* encompass a system where the chick is restricted by support poles. I understand that during prosecution Patent Owner amended the claims to add the limitation that the chick is “unrestrained” *specifically* to distinguish Yavnai. As I noted in my summary of the prosecution history, claim 1 as originally filed recited in pertinent part a “moving platform to support a chick.” Ex. 1002, 505. On November 5, 2019, however, the Examiner issued a non-final rejection finding that Tao in view of Yavnai rendered the claims obvious, noting Yavnai “teaches a method of automatic sexing of chicks.” *Id.*, 218. In response, Patent Owner amended claim 1 to add the “unrestrained” limitation. *Id.*, 184 (2/5/20 Amendment) (“a moving platform to support an unrestrained chick”).

162. The Patent Owner further submitted arguments along with its amendments, and explained that the “unrestrained” limitation distinguished the claimed invention over Yavnai because Yavnai’s poles restrain the chick:

Yavnai et al. teaches ***restraining a chick through the use of poles 64 or cups 40 to restrain the chick in order to cause the chick to open its wings.*** Amended claim 1 is directed to a system having a moving platform to support an unrestrained chick. A person of skill in this art would be discouraged from pursuing a system that allows a chick to be moved unrestrained

through the system on the basis of the teachings of Tao et al.
and Yavnai et al.

Id., 196. I understand that this statement explaining that the limitation “unrestrained” was added specifically to exclude from the claim any systems that use poles to restrain the chick.

163. As I noted above, after the amendment, the Examiner issued a notice of allowance agreeing that Yavnai did not disclose a system where the chick is “unrestrained,” expressly stating that Yavnai “do[es] not disclose, teach or suggest, a moving platform to support an unrestrained chick of a particular breed ...” Ex. 1002 at 129. The emphasis on “unrestrained” was the Examiner’s. Accordingly, I understand that both Applicant (Patent Owner) and Examiner alike understood “unrestrained” to exclude systems like Yavnai with support poles that restrict a chick. In my opinion, both the public and a POSITA would have similarly understood “unrestrained” to exclude systems like Yavnai with support poles that restrict a chick. I am not aware of any basis or reason why a POSITA would have different understanding, one that would remove the clearly drawn distinction between an “unrestrained” chick and a chick restricted by support poles.

4. Goodwin (Grounds 3, 5)

164. Grounds 3 and 5 rely on Goodwin as disclosing “a moving platform to support ***an unrestrained chick*** of a particular breed,” and

Goodwin in combination with Pierre as disclosing “an image capture device to capture at least one image of ***the chick***.” I understand Petitioner asserts that “[i]t would have been obvious to a POSITA to replace the manual chick sexing station of Goodwin with the automated sexing of Pierre by placing Pierre’s image capture device at the upper end of Goodwin’s conveyor 18 and capturing an image of each chick **when it drops off the end of the conveyor**.” Pet. at 31.

165. In my opinion, Petitioners’ argument confirms that Goodwin does not disclose the claimed “moving platform” because, as I explained in *supra* Section VIII, a POSITA would have understood the claims to require that the chick be supported by the moving platform when its image is taken. In contrast, Petitioner admits that in Goodwin the chick *drops off* the conveyor right before an image would be taken. Accordingly, a POSITA would understand that in Goodwin the chick would not be supported by the “moving platform” when its image is taken. In my opinion, Goodwin does not disclose the claimed moving platform, and Goodwin fails to disclose this limitation in a similar way that Gershman does. *See supra* Section IX.A.1.

B. The POSITA Would Not Have a Motivation to Combine or Reasonable Expectation of Success

166. In my opinion, and as I explain in further detail below, Petitioner has also not shown, and cannot show, a motivation to combine or reasonable expectation of success for its proffered combinations.

1. A POSITA Would Not Be Motivated to Combine Gershman with Pierre or Had a Reasonable Expectation of Success in Doing So (Grounds 1, 4, 6-7)

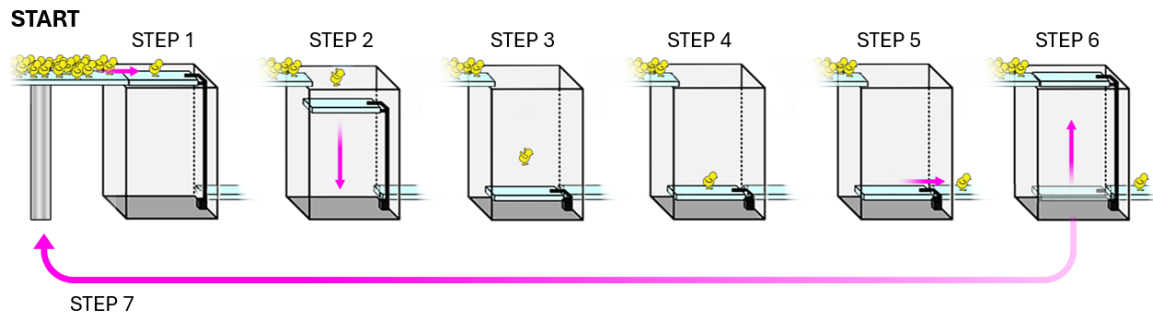
167. In my opinion, a POSITA would not have been motivated to combine Gershman and Pierre as Petitioner proposes. As Petitioner's only evidence of any alleged obviousness is Gershman's statement that "[i]t is obvious, that this idea can simply adapted [sic] on to the line that are wide used [sic] for counting and packaging hatching chicks." Petitioner then directly concludes that a POSITA would have found it obvious to integrate Gershman with Pierre. Ex. 1003, 10; Pet., 24. I disagree.

168. In my opinion, a POSITA would have understood Gershman's proposed integration as wishful thinking. A POSITA would have further realized that Gershman's ignores the numerous problems associated with integrating such a combination in commercial hatcheries sorting up to twelve chicks per second. In my opinion, a POSITA would have rejected such a combination as unworkable. As I explained above, this is because a POSITA would have recognized that combining Gershman's movable plate system into

any industrial poultry hatching system (which Pierre describes its system to be (Ex. 1004, Abstract, 2-3)) would unsustainably slow down the operation's sexing capabilities to such a degree it would be impractical and unworkable. A POSITA would have understood that rapid movement of chicks is critical in an industrial system (*see, e.g.*, Ex. 1006, 3:1-11 (automated operations achieving up to twelve chicks per second), and bottlenecks caused by a manually movable plate that has to be lowered and raised for each chick would create an unacceptable bottleneck in an industrial context. In my opinion, a POSITA would not have been motivated to integrate the manually movable plate of Gershman into an industrial system such as the one of Pierre, precisely because to do so would drastically reduce the extremely high throughput rate which industrial breeding centers achieve and seek to improve.

169. Specifically, a POSITA would have understood that a Gershman-Pierre combination would result in a system that requires putting individual chicks, one by one, onto the stationary plate and individually performing the drop plate operation (with the plate starting stationary at Step 1, dropping out from under the chick at Step 2, becoming stationary again at Steps 3 & 4, removing the chick from the plate at Step 5, then having the plate do back up

at Step 6, then somehow getting one and only one more chick back on the stationary plate at Step 7).⁷



170. A POSITA would have understood such a proposed system would be unworkably slower than what an industrial system demands. In my opinion, the POSITA would have recognized immediately that Gershman-Pierre would result in a system that cannot achieve the throughput required by industrial processes. Again, this because a POSITA would have recognized that combining Gershman's movable plate system into any industrial poultry hatching system (which Pierre describes its system to be (Ex. 1004, Abstract, 2-3)) would unsustainably slow down the operation's sexing capabilities to such a degree it would be impractical and unworkable. A POSITA would have known that rapid movement of chicks is critical in an industrial system. See, e.g., Ex. 1006, 3:1-11 (automated operations achieving up to twelve chicks

⁷ Nowhere does Gershman even propose what an industrial system would look like. However, in my declaration I consider how a hypothetical system would operate if, as Petitioner argues, one were to combine the references Petitioner relied on.

per second), Ex. 2006, 1 (referring to “hatcheries producing more than one million chicks per week.”). Accordingly, bottlenecks caused by a manually movable plate that has to be lowered and raised for each chick would be unacceptable in an industrial context. I note that one of the other references Petitioner cites (Tao) also observes that, as of at least 1999, a typical hatching operation will produce roughly 250,000-500,000 baby chicks a day that need to be sexed and sorted as quickly as possible. Ex. 1006, 3:7-10. Even in 1999, Tao observed that there were solutions for “distinguish[ing] male and female chicks at an accuracy of up to 95% or higher at up to 12 chicks / sec.” *Id.*, 3:7-10. By the time of the invention in the ’124 patent, throughput demands were even higher. Accordingly, in my opinion there would be no reason that a POSITA would be motivated to combine Gershman with Pierre.

171. In my opinion, the unworkable Gershman-Pierre combination proposed by the Petitioner fails to consider a POSITA’s knowledge, and thus failing to consider any of the many reasons why a POSITA would not be motivated to make this combination.

172. In my opinion, any POSITA would recognize that, to the extent it is even possible, combining Gershman’s drop plate solution into any industrial chick processing system (such as Pierre’s) would be like using a vehicle lift for cars exiting the freeway instead of an offramp for vehicle

routing—the traffic jam would be tremendous. As I explained above, in the context of high-volume chick hatchery operations which strive to process a high number of chicks safely and accurately, such a traffic jam would be completely unacceptable – it would jeopardize the health of the chicks, and would have an impact on the profitability of the operation. In my opinion, a POSITA would recognize this, and would understand that the Gershman-Pierre combination would represent a monumental step backward in the progress already made in earlier automated systems. As such, I simply see no way that a POSITA would have been motivated to make the Gershman-Pierre combination to achieve a significantly inferior solution.

173. As an additional consideration, the slower pace of sexing chicks in the Gershman-Pierre combination, to the extent they could even be combined, would lead to build-up of chick droppings on Gershman's movable plate, which the Gershman reference describes as transparent. As I explained above, a POSITA would have understood that a buildup of droppings would entirely prevent the Gershman system from operating to successfully sex chicks. This is because the imaging process in Gershman relies on the clarity of the movable plate and white light illumination to capture a black and white image with high clarity. As a POSITA would recognize, the proposed Gershman-Pierre system would also be compromised by droppings left on the

movable plate. In contrast, the '124 patent inventions do not rely on a transparent platform to take images of the chick and thus does not suffer from this problem. Neither Gershman nor Pierre discuss or disclose anything about how to filter such droppings out of the image and/or clean off the plate. In my opinion, cleaning up the chick droppings manually would take additional time and defeat the purpose of automation in the first place. A POSITA would have realized that the proposed Gershman-Pierre system, instead of achieving a higher throughput, would simply result in personnel jobs being changed from manual sexing to laborious cleanup, and would decrease the throughput of the entire operation. I can see no reason why a POSITA would be motivated to achieve such an inefficient result through the Gershman-Pierre combination.

174. The Petitioner's conclusory assertions that a POSITA would have been motivated to make the combination lacks any supportive motivation and also overlooks numerous other problems with combining Gershman with any other systems (including that described in Pierre). For instance, the Gershman reference does not contain any discussion or disclosure of how chicks can be moved, one at a time, onto the movable plate in a manner that does not injure the chicks and/or does not overload the drop plate with more than one chick at a time. A POSITA would have realized that

without a solution for moving the chicks, the Gershman-Pierre combination is not feasible. As another example, Pierre does not discuss much less provide a solution to the problem of how a single reference image approach can be used to make determinations regarding whether a chick is health or unhealthy. In my opinion, a POSITA would understand the magnitude of this problem, given the number of possible health problems with chicks but having only a single reference image. Similarly, there is no discussion or disclosure of how chicks should be centered on the movable plate such that, when the plate is dropped, their wings won't hit the sidewalls during the fall. Again, a POSITA would have realized that without addressing the chicks' positioning and safety the Gershman-Pierre combination is not feasible. This is because a POSITA would understand that if the chicks are not centered, or if their wings hit the sidewalls, any captured image would be substantially unusable for the purpose Gershman and/or Pierre propose. The POSITA would have also understood that chick positioning is key to avoid injuries to day-old chicks. A POSITA would have similarly understood that avoiding such injuries is important because injured chicks will be pushed away by un-injured chicks from feeders and water dispensers, resulting in malnutrition and mortality. Similarly, a POSITA would have realized there is no discussion or disclosure of what happens to the chicks that are waiting for the movable plate to return, and how

they ensure that those chicks that are waiting do not fall down the movable plate shaft while in operation. Again, a POSITA would have understood that without a solution for this problem the Gershman-Pierre combination is not feasible because it would injure the chicks.

175. I have seen no evidence in Gershman's and Pierre's disclosures of how they would solve any of these issues. In light of them, in my opinion a POSITA would have neither a motivation nor expectation of success in combining Gershman with Pierre or any other industrial system. I note that the Gershman reference ends with a plea for a "strategic partner" to attempt the approach in the "poultry industry." Ex. 1003, 10. I am not aware of any evidence that a POSITA ever took up Gershman on that offer, and I am not aware of any evidence that Gershman's system was ever used in an industrial facility anywhere in the world.

2. A POSITA Would Not Be Motivated to Combine Yavnai with Pierre (Grounds 2 & 8)

176. In my opinion, a POSITA would not have been motivated to combine Yavnai and Pierre or had a reasonable expectation of success in doing so.

177. As an initial matter, a POSITA would recognize that the system of Yavnai simply does not work for the intended purpose of industrial chicken sexing for two reasons. First, as I explained above, a POSITA would have

understood that Yavnai requires the chick to be highly restrained with poles in order to be able to successfully capture an image of the chick in the precise configuration (shown in Figure 5B) required for it to work. However, as a POSITA would have known, one-day old chicks are very fragile and prone to injury. In my opinion, a POSITA would have known that moving young chicks quickly along a conveyor only to bump into restraining poles, which at latter points along the conveyor further restrict their wing movement, would result in a high chance of injury to the chick – for this reason, a POSITA would not have been motivated to use the Yavnai system at all. In my opinion, the POSITA would especially be disinclined to use it in combination with Pierre, which describes itself as for an industrial system. *See e.g.*, Ex. 1004 at Abstract, 4, 5. In my opinion, given the high speeds at which industrial breeding centers process chicks (*see e.g.*, Ex. 1006, 3:1-11), a POSITA would have understood that if chicks were to hit the poles of Yavnai at the rates required by such industrial systems as Pierre, chicks would be even more likely to be injured than in Yavnai's system alone.

178. Second, as I explained above, Yavnai's system requires chicks to be highly restrained with poles. In Yavnai, chicks are restrained from lateral movement when they step on the conveyor, and the poles restrain the chick's wings with poles leading up to the point of imaging. However, a POSITA

would have understood that Yavnai's system fails to account for the risk that its restraint system (the poles) may also fail to keep the chick facing forward and therefore may not effectively restrain the chicks as needed to practice the invention. The chicks could *rotate* around in place before their wings are restrained, as I've illustrated in Fig. 5A below:

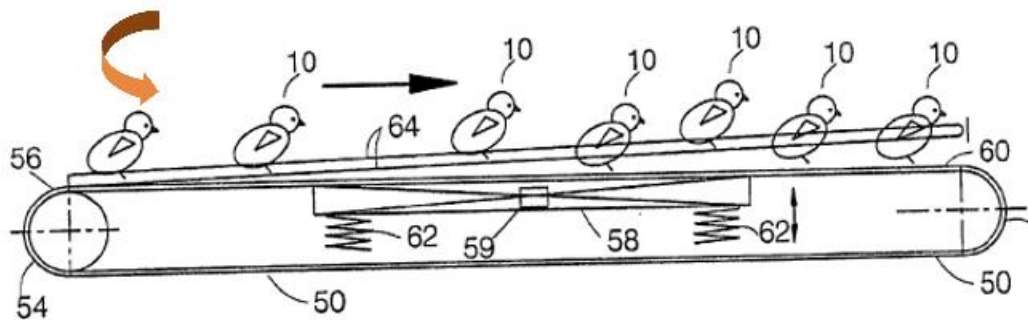


FIGURE 5A

If the chick rotates around in place before its wings are restrained, then by the time it gets to the end of the conveyor it will be in an undesired (and harmful) position. The chick is still restrained, but in the wrong configuration for imaging.

179. Accordingly, in my opinion the POSITA would not be motivated to use Yavnai's system at all, nor to combine it with Pierre (which would do nothing to address this fundamental failure of Yavnai).

180. I understand Petitioner to argue that "[i]t would have been obvious to a POSITA that the camera of Yavnai is in communication with a

computer processor having the database of reference images so that an image captured by the camera can be processed in the computer processing method taught by Pierre to determine the sex of a chick with a reasonable expectation of success.” Pet., 28. I disagree, because in my opinion Petitioner’s conclusory statements misrepresent Yavnai. Yavnai’s system (purportedly) allows chick sexing by processing a single image of a chick, without resorting to a database of images for reference. Accordingly, as a POSITA would have understood, there is no need or motivation to add another imaging and/or computer processing system to the system of Yavnai, and thus there is no need or motivation to add another imaging and/or computer processing system as Petitioner suggests. If Yavnai was able to determine sex by processing a single image without resorting to a database of images for reference, as long as Yavnai’s system or a modified Yavnai’s system continued to use “blue monochromatic light,” a POSITA would have understood that combining Pierre’s database of images into the system of Yavnai would only add unnecessary redundancy. Ex. 1005 at [0038].

181. The system of Yavnai already provides a system to “enhance the contrast between chick 10’s white wing tips and yellow body,” and applies image processing without the need for a database of reference images. *Id.* In my opinion, a POSITA considering the system of Yavnai would not be

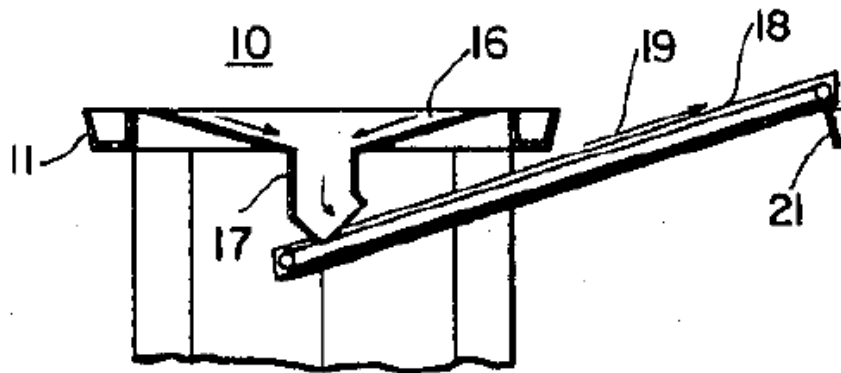
motivated to combine Yavnai with a reference like Pierre, which would change the principal of operation of Yavnai. Instead, a POSITA would have understood that Yavnai's system operated to analyze feathers of a chick without the need for a reference image. In my opinion, no POSITA would have been motivated, based on Yavnai's teachings, to look for a different solution, such as Pierre's, because such a solution would only add redundancies to the Yavnai system. Accordingly, a POSITA would not have been motivated to combine Yavnai with Pierre and thus Grounds 2 and 8 fail.

3. A POSITA Would Not Be Motivated to Combine Pierre with Goodwin as Petitioner Proposes (Grounds 3 & 5)

182. In my opinion, a POSITA would not have been motivated to combine Pierre and Goodwin as Petitioner proposes. All Petitioner states is that "[i]t would have been obvious to a POSITA to replace the manual chick sexing station of Goodwin with the automated chick sexing station of Pierre by placing Pierre's image capture device at the upper end of Goodwin's conveyor 18 and capturing an image of each chick when it drops off the end of the conveyor to further automate the Goodwin system and reduce the number of personnel required to perform chick sexing with a reasonable expectation of success." Pet., 31.

183. In my opinion this is incorrect – a POSITA would not have any such motivation. As a POSITA would have known, the purpose of determining sex of a chick during transport of a chick on a “moving platform” is to enable the system to ultimately route different chicks into different groups based on the sex determination. In the proposed Pierre-Goodwin combination, Pierre’s image capture device would be placed “at the upper end of Goodwin’s conveyor 18” such that the chick is put into a falling state – to cause it to open its wings – as the chick drops off the end of the last conveyor, and then “capturing an image of each chick when it drops off the end of the conveyor.” Pet., 31. However, a POSITA would understand – and Petitioner improperly ignored - that once the chick is dropped off the conveyor, the chick is no longer on any conveyor and as such can no longer be routed according to its sex. The Pierre-Goodwin combination would thus require each chick, after it has dropped off the conveyer, to be picked up manually by an operator, and physically placed in the correct location. However, as a POSITA would have understood, such an additional manual operation would be time consuming, and would defeat the purpose of the automated “moving platform” based inspection system claimed in the ’124 patent. Accordingly, in my opinion, a POSITA would not be motivated to make the proposed Pierre-Goodwin combination.

184. As I've previously explained for other combinations, Petitioner again fails to account for the harm that may be caused to chicks by having those chips dropped off from the conveyor 18. A POSITA would have been aware of the risk, and would have understood that because the conveyor 18 is substantially higher off the ground than a chick is expected to be able to fall without injury, chicks would likely be injured by such a drop.



Ex. 1007 at Fig 2 (cropped).

185. I am not aware of either Pierre or Goodwin ever addressing any of these issues anywhere in their disclosures, nor does Petitioner. In my opinion, a POSITA would have had no motivation to combine Pierre and Goodwin, and would have had no expectation of success in combining Pierre and Goodwin. To the contrary, a POSITA would have understood that the combination of Pierre-Goodwin would result in a system that would cause

harm to chicks, be inefficient, and represent a considerable step backward and failure relative to solutions at the time.

186. In my opinion, a POSITA would have had no motivation to do so.

X. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS SUPPORT VALIDITY

187. In my opinion, the following secondary considerations strongly support the non-obviousness of the '124 patent:

A. Long-felt but unmet need

188. Prior to the '124 patent inventions, industrial hatchery operations faced persistent challenges in achieving sexing and health detection with high throughput and high accuracy while at the same time prioritizing chick welfare. These challenges are highlighted in many publications, including in the references relied upon by the Petitioner, which, as explained above, failed to accomplish what the '124 patent has. Manual inspections on the one hand, and automated systems that involved too much delay or were not sufficiently accurate, were entirely unsuitable and static for the ever demanding hatchery operations. *See, e.g.*, Ex. 1001, 2:6-20, Ex. 1007, Abstract.

189. This long felt need was widely recognized in the prior art. Yavnai for example states that there “is thus a widely recognized need for, and it would be highly advantageous to have a way to automate the spreading

of the chicks' wings, which in turn would allow a fully automated sex identification sorting process based on examination of the wings.” Ex. 1005, [0005]. While recognizing the need for a solution, Yavnai filed to achieve one for the reasons discussed above. *See supra* IX.A.3. Unsurprisingly, there is no evidence of any real-world use of the Yavnai system (nor of any of the other prior art reference systems relied on by Petitioner).

190. In my opinion, the ‘124 patent addresses these long-standing needs by offering an elegant solution that achieves a high-throughput and high accuracy, while at the same time avoiding injury and prioritizing chick welfare. This solution is a direct result of the claimed features specifically, including but not limited to a moving platform that supports an unrestrained chick to efficiently move it through the imaging and analysis process.

B. Unexpected Results

191. In my opinion, a key innovation of the ‘124 patent is the recognition that by avoiding mechanisms that restrain the chick while on a “moving platform” yet still provide the needed wing-spreading stimuli, and by leveraging a whole database of images of chick features for a particular breed, that higher throughput could be achieved with greater accuracy. As demonstrated in the prior art – the conventional wisdom before the ‘124 patent was that it was necessary to restrain a chick in some manner to image it (as in

Yavnai for example) or that the chick needed to be free-falling and unsupported to take its image (as in Gershman). The '124 patent bucked conventional wisdom, creating a system where a chick is *unrestrained* yet *supported* as it is imaged.

192. Further, the amount the chick was physically manipulated was reduced by the solution provided in the '124 patent, thereby leading to fewer injuries at the hatchery and reduced mortality in the farm. Prior art methods had been unable to achieve the optimal balance reached by the '124 patent's elegant solution, perhaps considering them too complex or resource-intensive to implement.

193. These unexpected results further reinforce the non-obviousness of the '124 patent. These unexpected results are a direct result of the claimed features specifically, including but not limited to a moving platform that supports an unrestrained chick to efficiently move it through the imaging and analysis process.

XI. CONCLUSION

194. For the reasons set forth above, I believe claims 1-18 of the '124 patent are not obvious in view of the prior art and grounds presented in the Petition. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board

of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in this case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

195. I declare that all statements made herein of my knowledge are true, that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: November 11, 2024

By: Kevin M. Keener
Kevin M. Keener, Ph.D., P.E.