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Application number: **17242350**

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THE UNITED STATES OF AMERICA

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United States Patent and Trademark Office

December 21, 2021

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: 17/242,350
FILING DATE: April 28, 2021

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS US17/242,350



Certified by

Performing the Functions and Duties of the
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UTILITY PATENT APPLICATION TRANSMITTAL <i>(Only for new nonprovisional applications under 37 CFR 1.53(b))</i>	Attorney Docket No.	T12-7135US0 085093-681330
	First Named Inventor	Babu Kuruvilla
	Title	Egg Carton with Dual Handles
	Priority Mail Express® Label No.	

APPLICATION ELEMENTS <i>See MPEP chapter 600 concerning utility patent application contents.</i>	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450
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1. ☒ Fee Transmittal Form (PTO/SB/17 or equivalent) 2. ☐ Applicant asserts small entity status. See 37 CFR 1.27 3. ☐ Applicant certifies micro entity status. See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent. 4. ☒ Specification [Total Pages <u>20</u>] Both the claims and abstract must start on a new page. (See MPEP § 608.01(a) for information on the preferred arrangement) 5. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets <u>9</u>] 6. Inventor's Oath or Declaration [Total Pages _____] (including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e)) a. ☐ Newly executed (original or copy) b. ☐ A copy from a prior application (37 CFR 1.63(d)) 7. ☒ Application Data Sheet * See note below. See 37 CFR 1.76 (PTO/AIA/14 or equivalent) 8. CD-ROM or CD-R in duplicate, large table, or Computer Program (Appendix) ☐ Landscape Table on CD 9. Nucleotide and/or Amino Acid Sequence Submission (if applicable, items a. – c. are required) a. ☐ Computer Readable Form (CRF) b. ☐ Specification Sequence Listing on: i. ☐ CD-ROM or CD-R (2 copies); or ii. ☐ Paper c. ☐ Statements verifying identity of above copies	ACCOMPANYING APPLICATION PAPERS 10. ☐ Assignment Papers (cover sheet & document(s)) Name of Assignee _____ 11. ☐ 37 CFR 3.73(c) Statement ☐ Power of Attorney (when there is an assignee) 12. ☐ English Translation Document (if applicable) 13. ☐ Information Disclosure Statement (PTO/SB/08 or PTO-1449) ☐ Copies of citations attached 14. ☐ Preliminary Amendment 15. ☐ Return Receipt Postcard (MPEP § 503) (Should be specifically itemized) 16. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed) 17. ☐ Nonpublication Request Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent. 18. ☐ Other: _____ _____ _____ _____ _____
--	---

***Note:** (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must** be included in an Application Data Sheet (ADS).
(2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS				
☒ The address associated with Customer Number: <u>21127</u> OR ☐ Correspondence address below				
Name				
Address				
City	State	Zip Code		
Country	Telephone	Email		

Signature	/Therese A. Hendricks/	Date	April 28, 2021
Name (Print/Type)	Therese A. Hendricks	Registration No. (Attorney/Agent)	30389

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

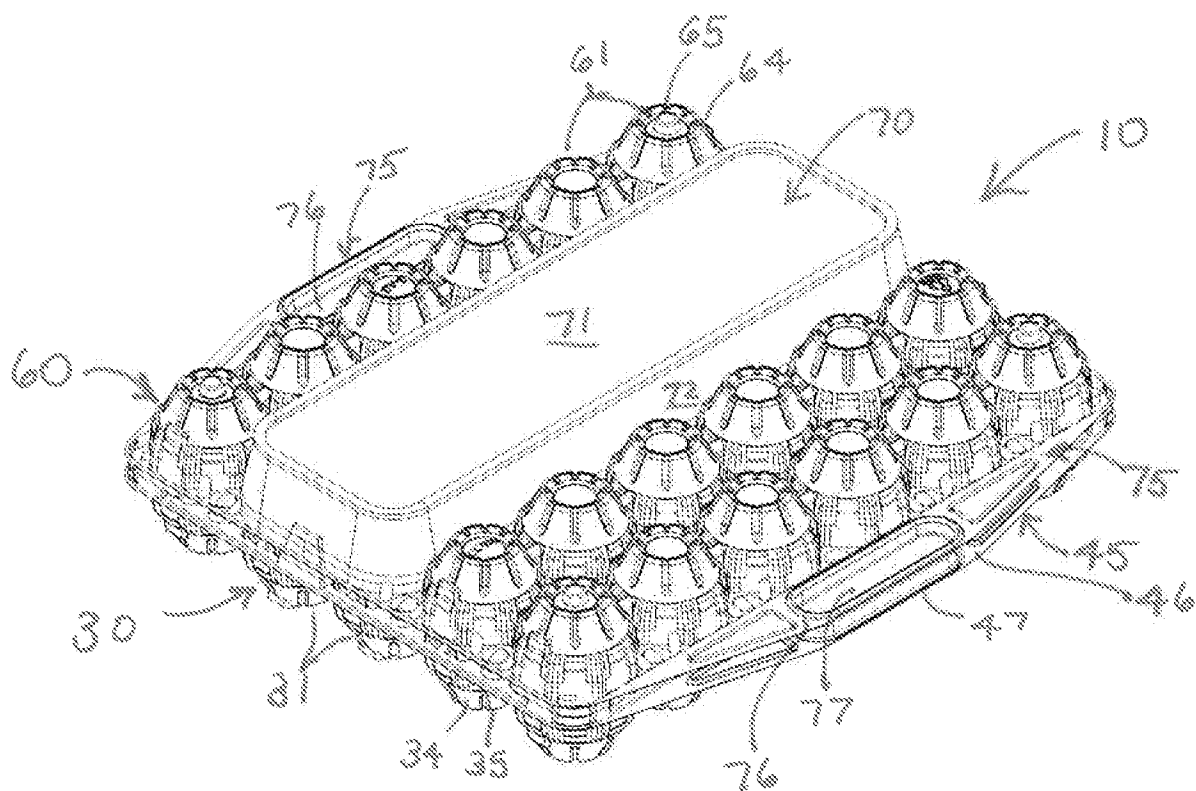


FIG. 1

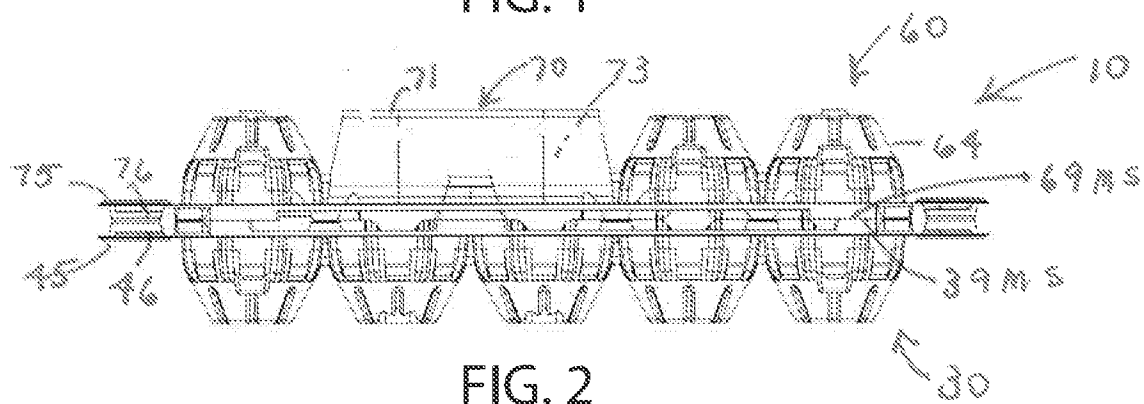


FIG. 2

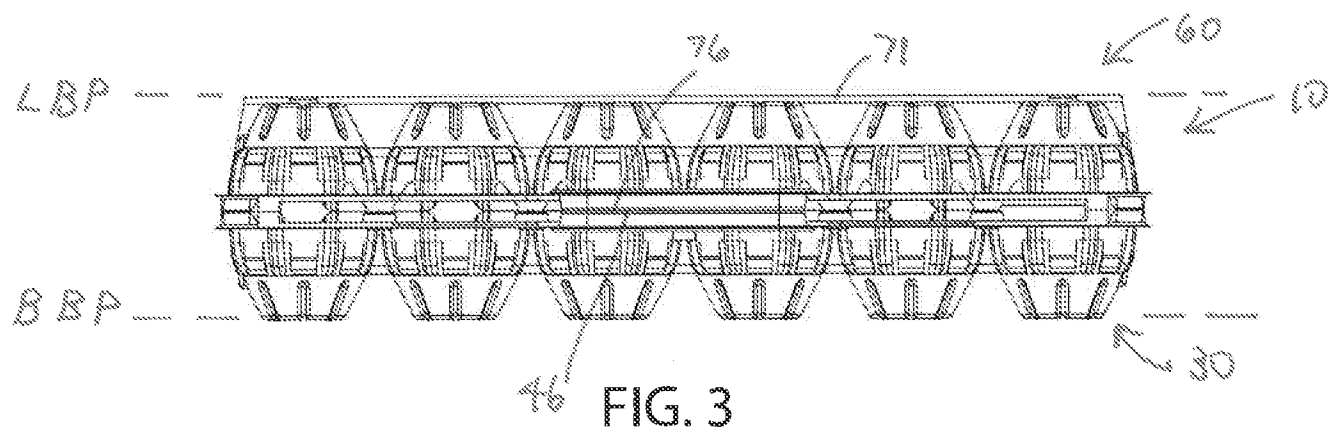


FIG. 3

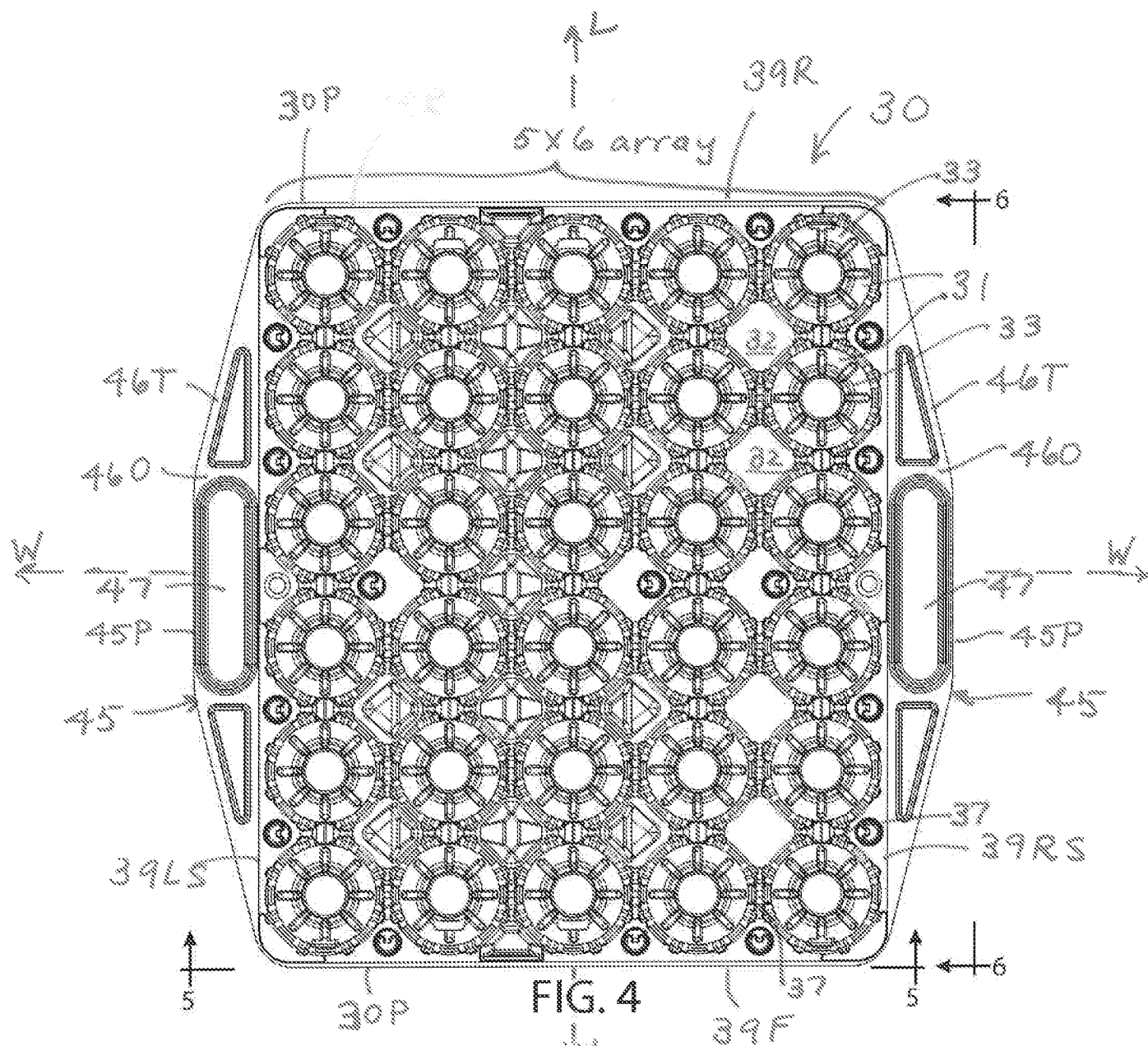


FIG. 4

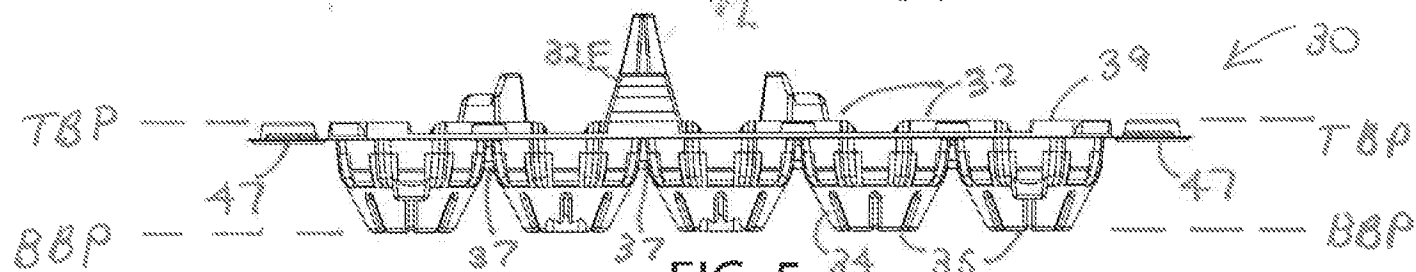


FIG. 5

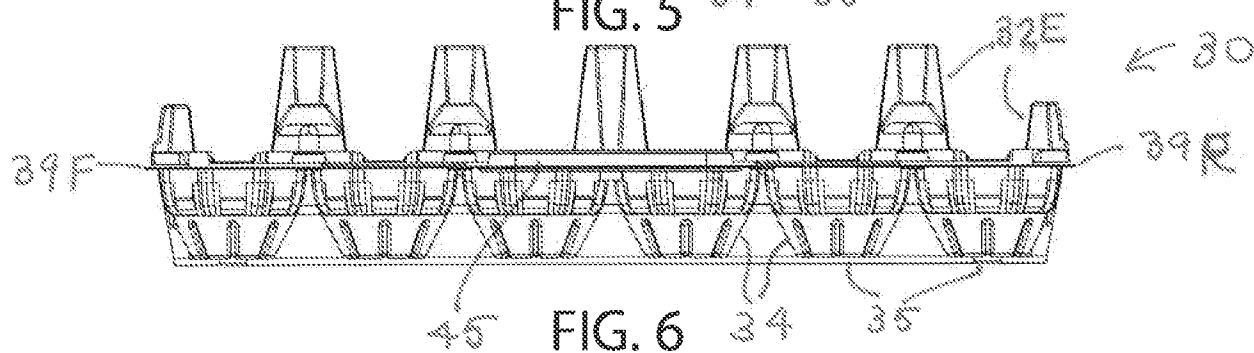
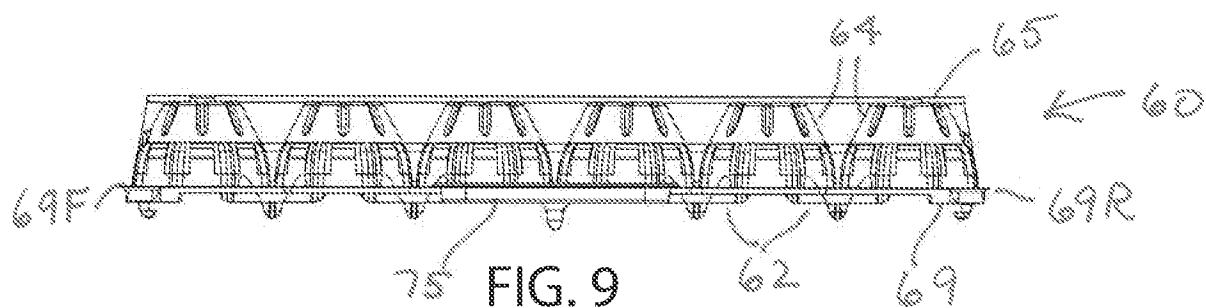
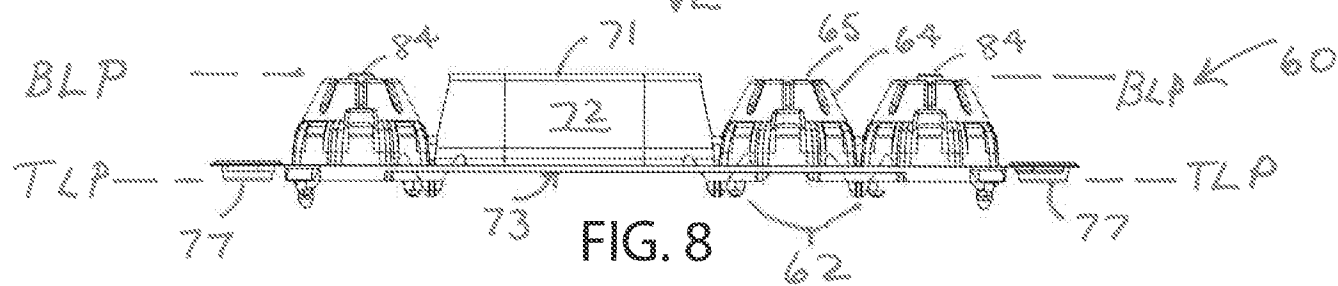
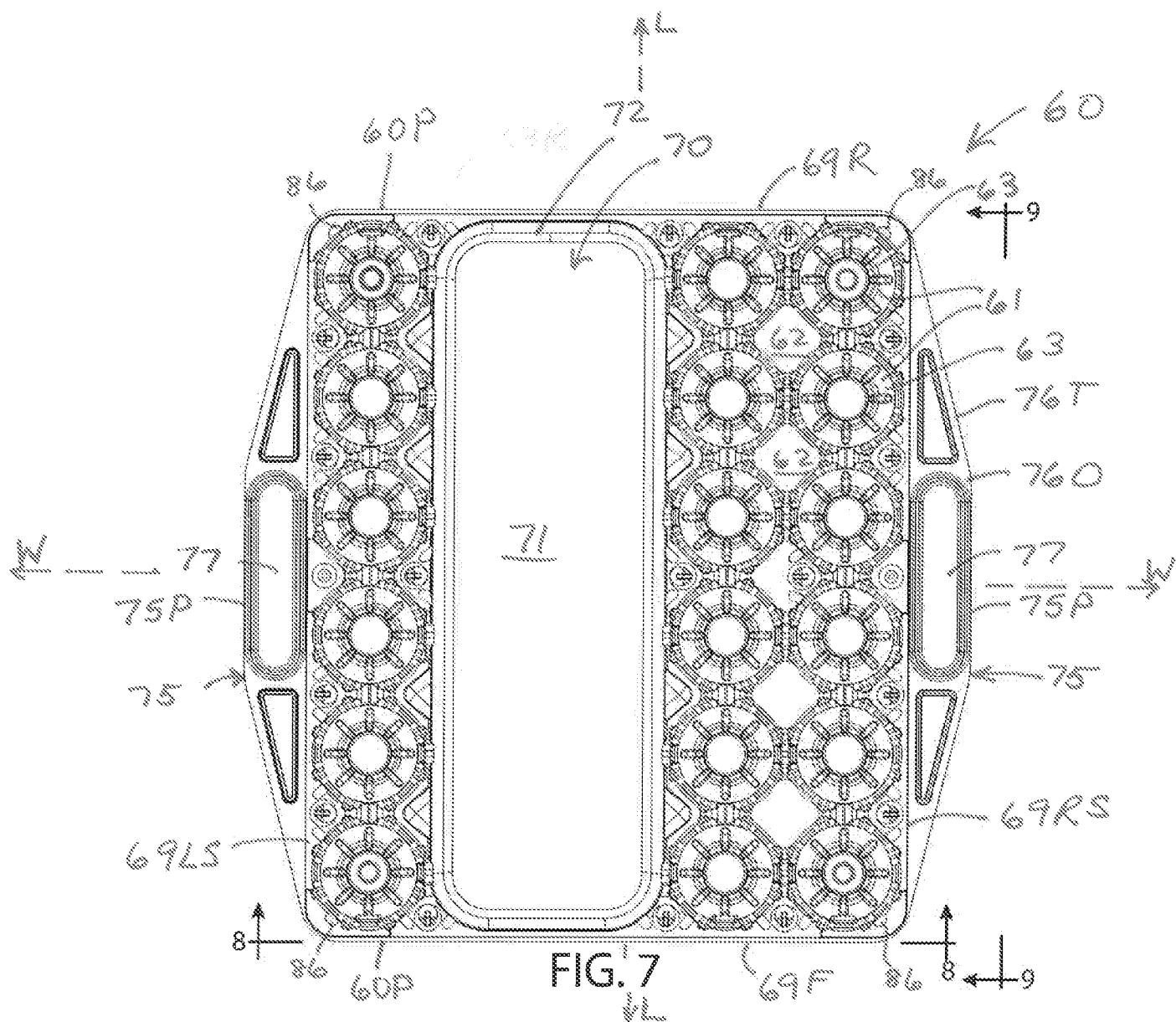


FIG. 6



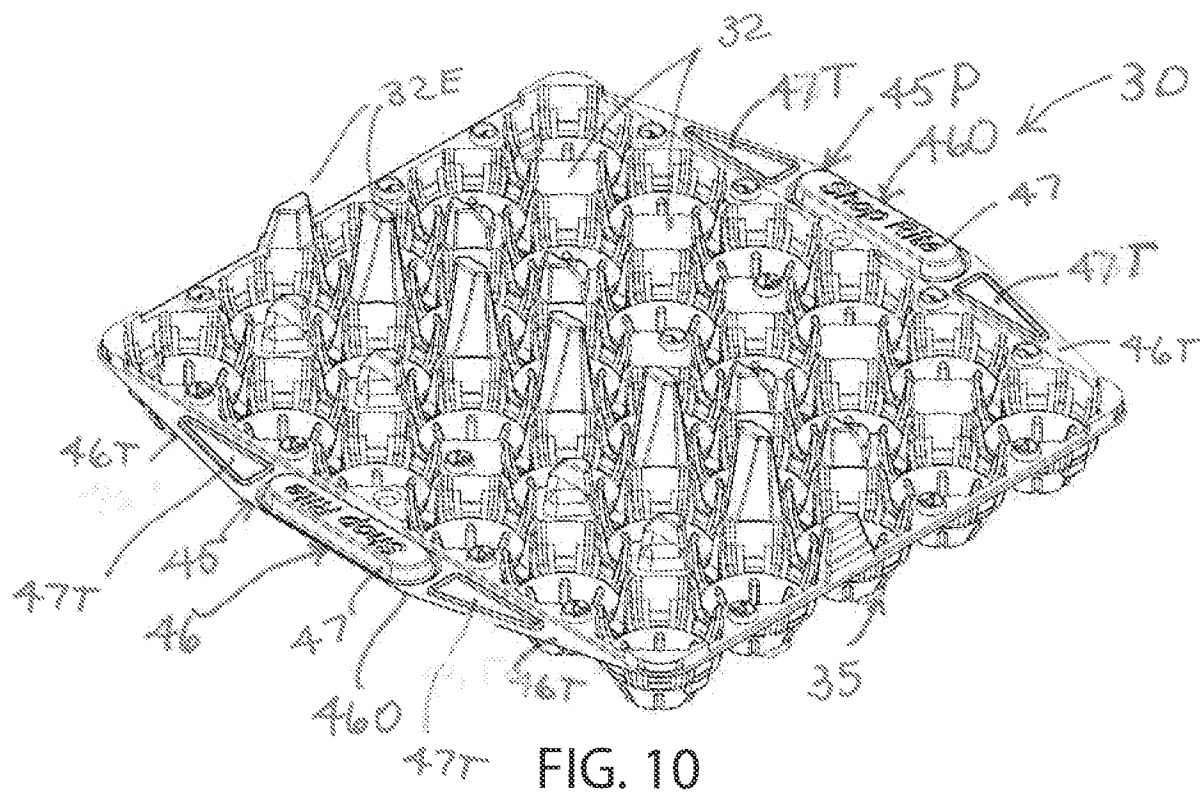


FIG. 10

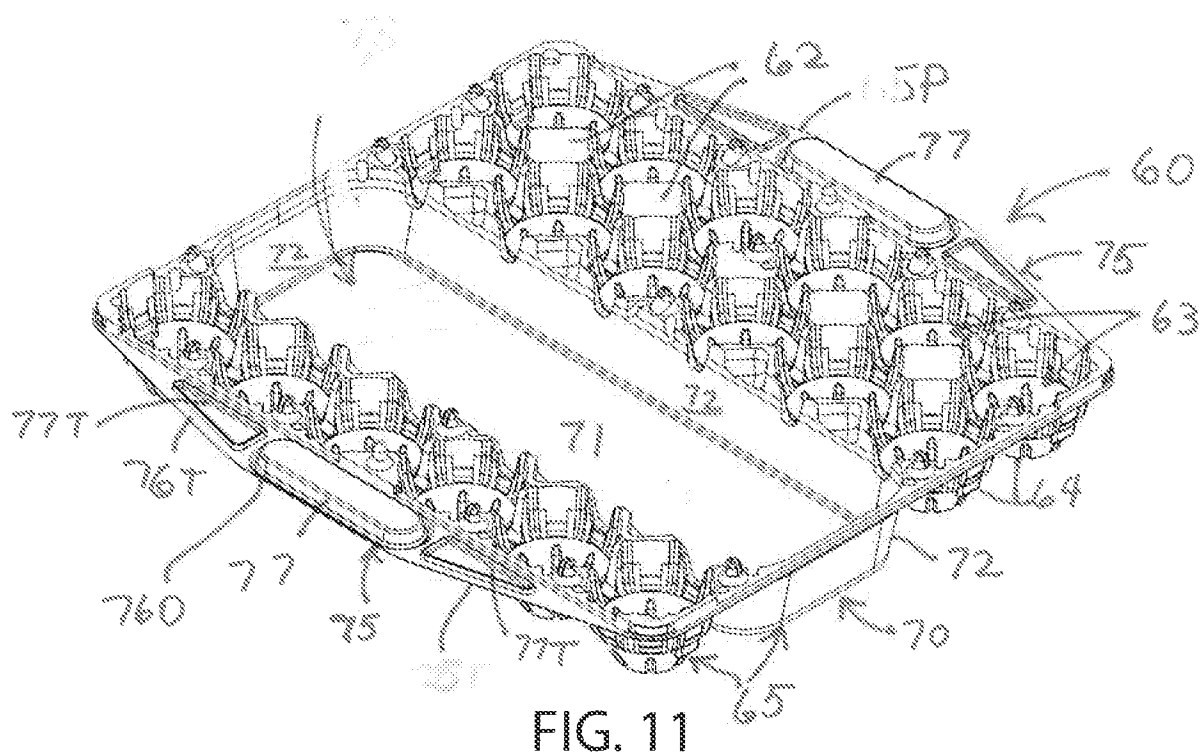


FIG. 11

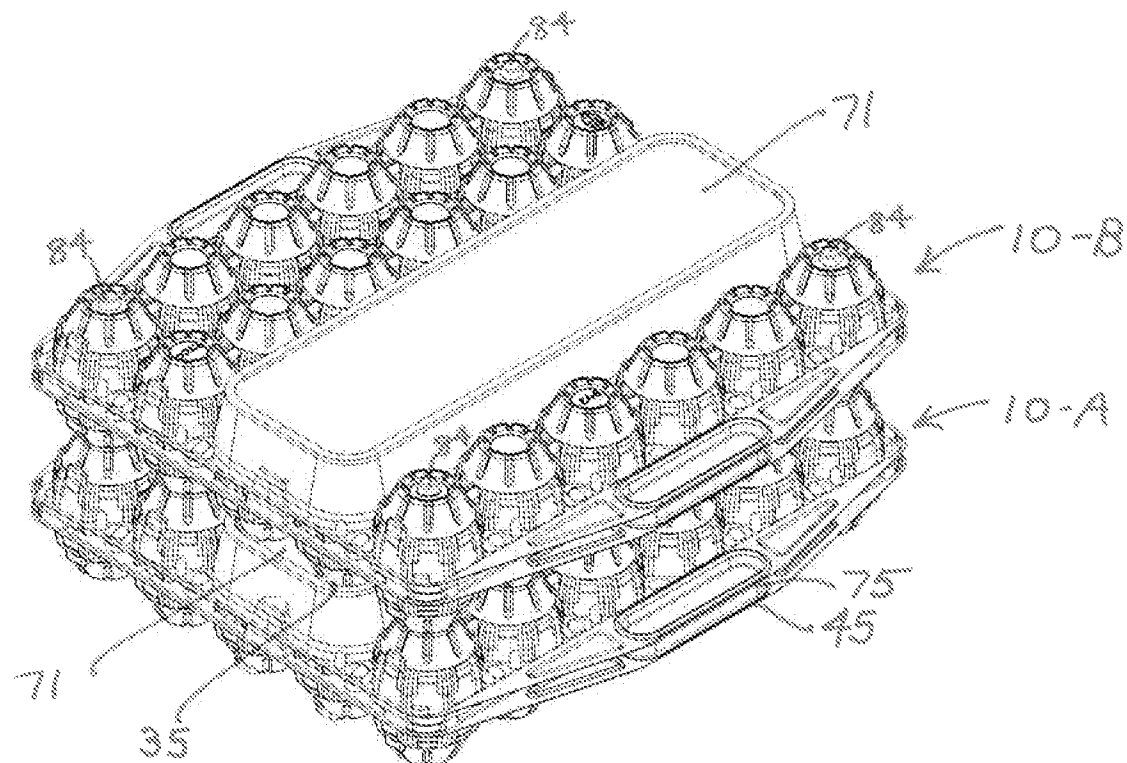


FIG. 12

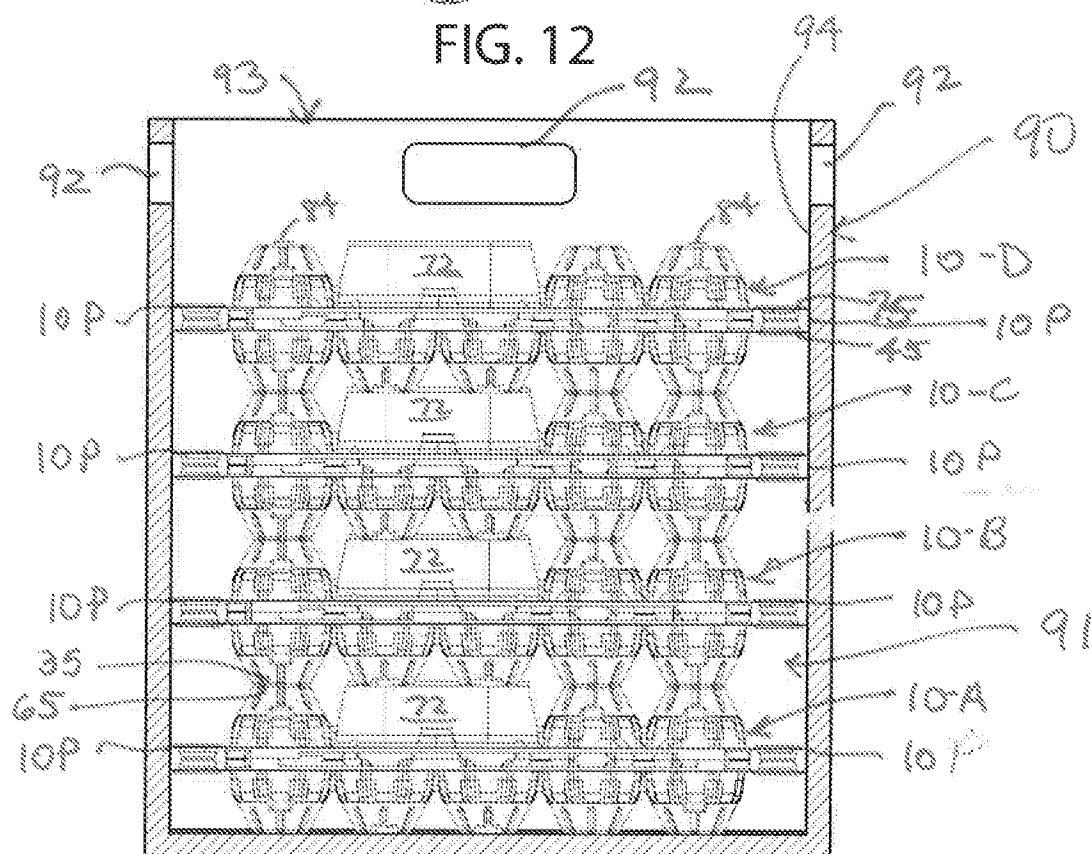


FIG. 13

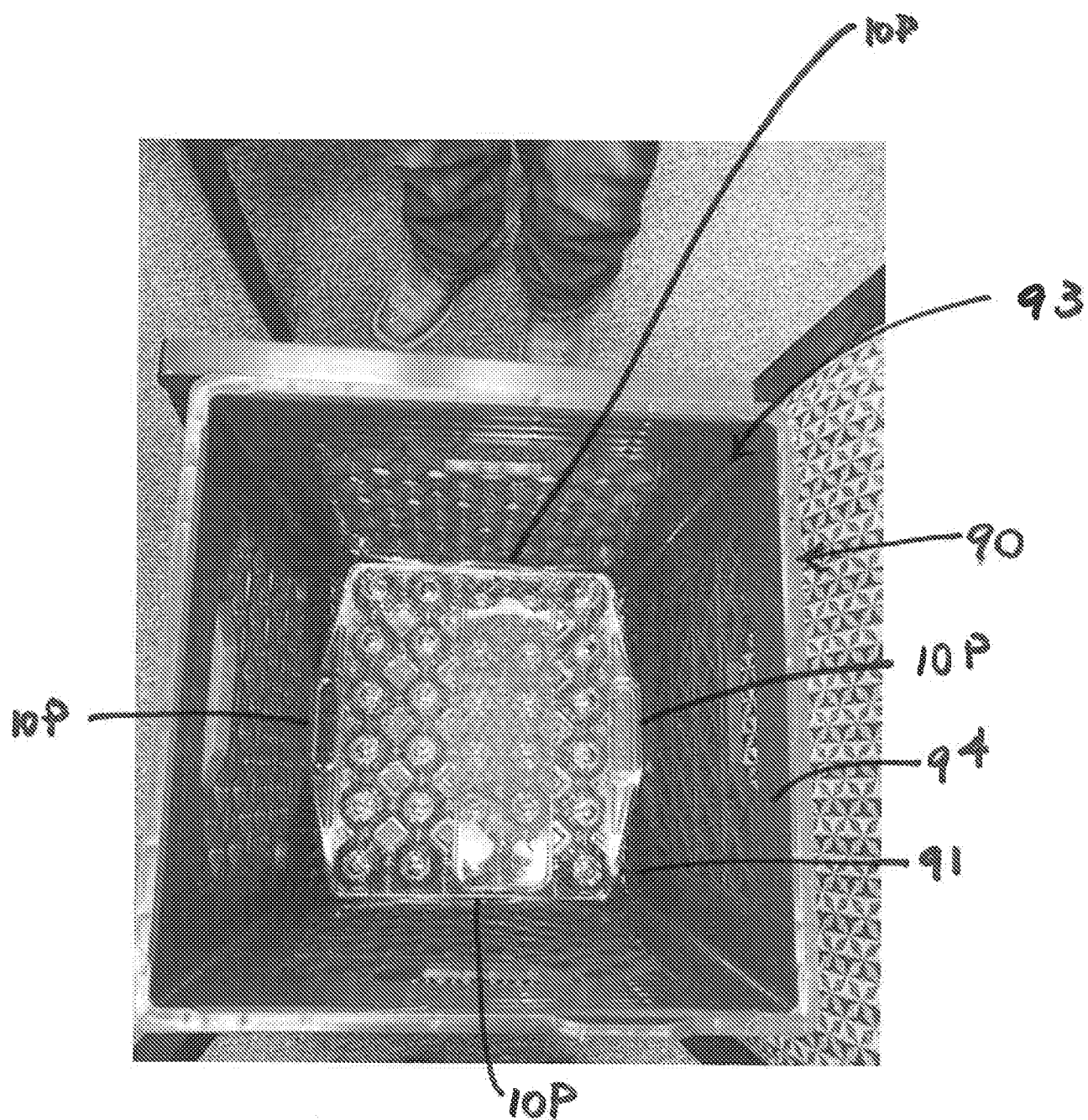


Fig. 13H

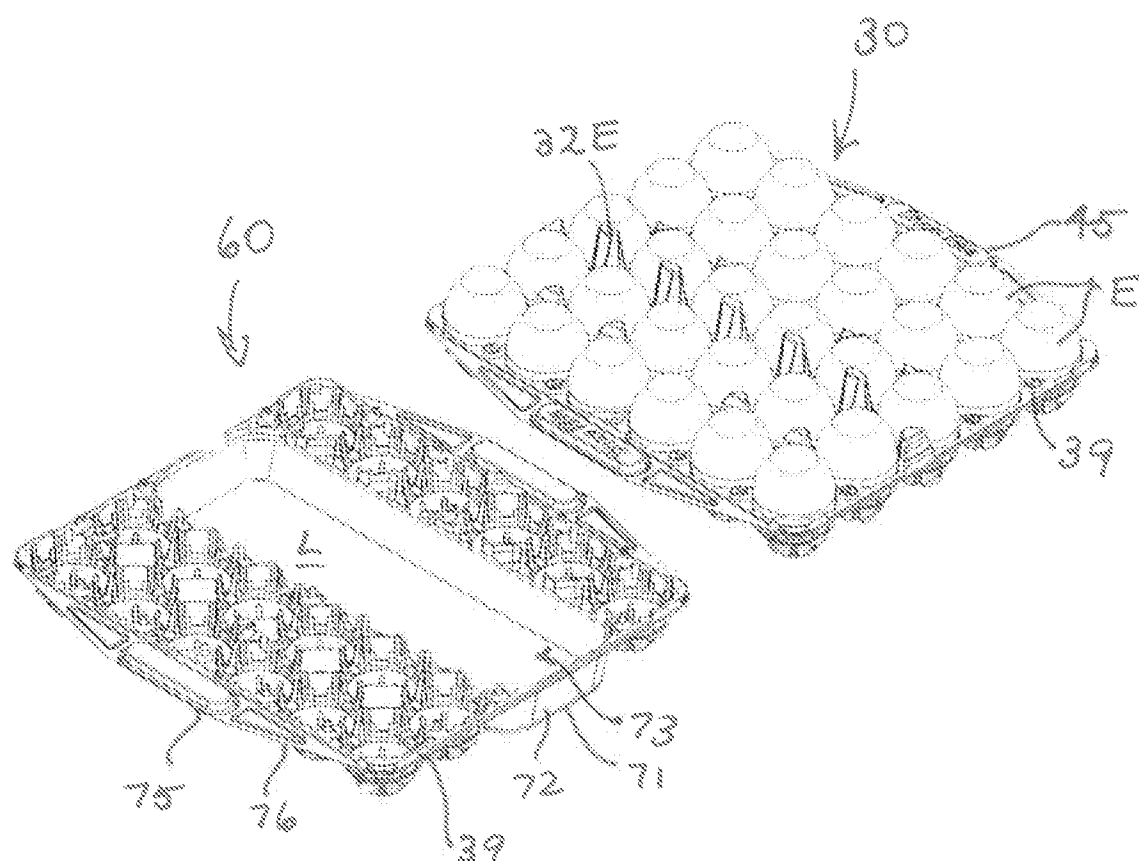


FIG. 14

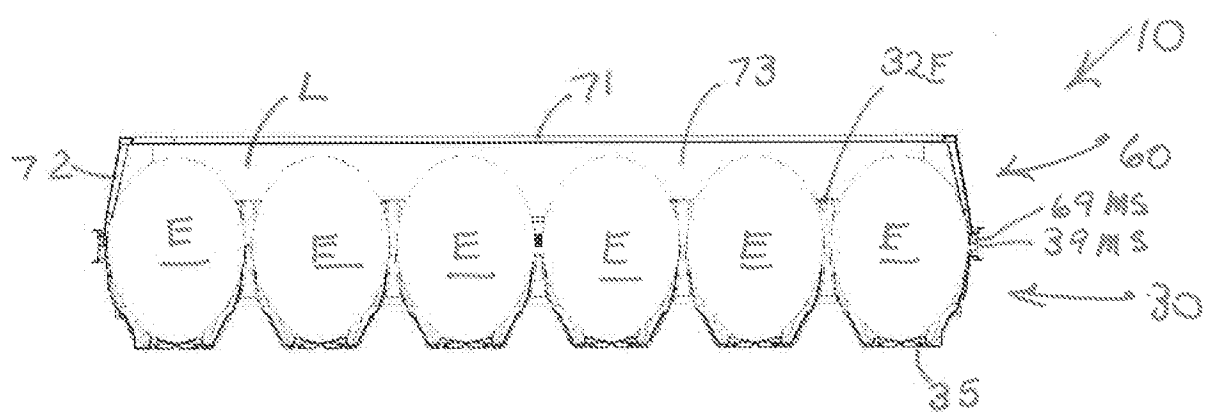
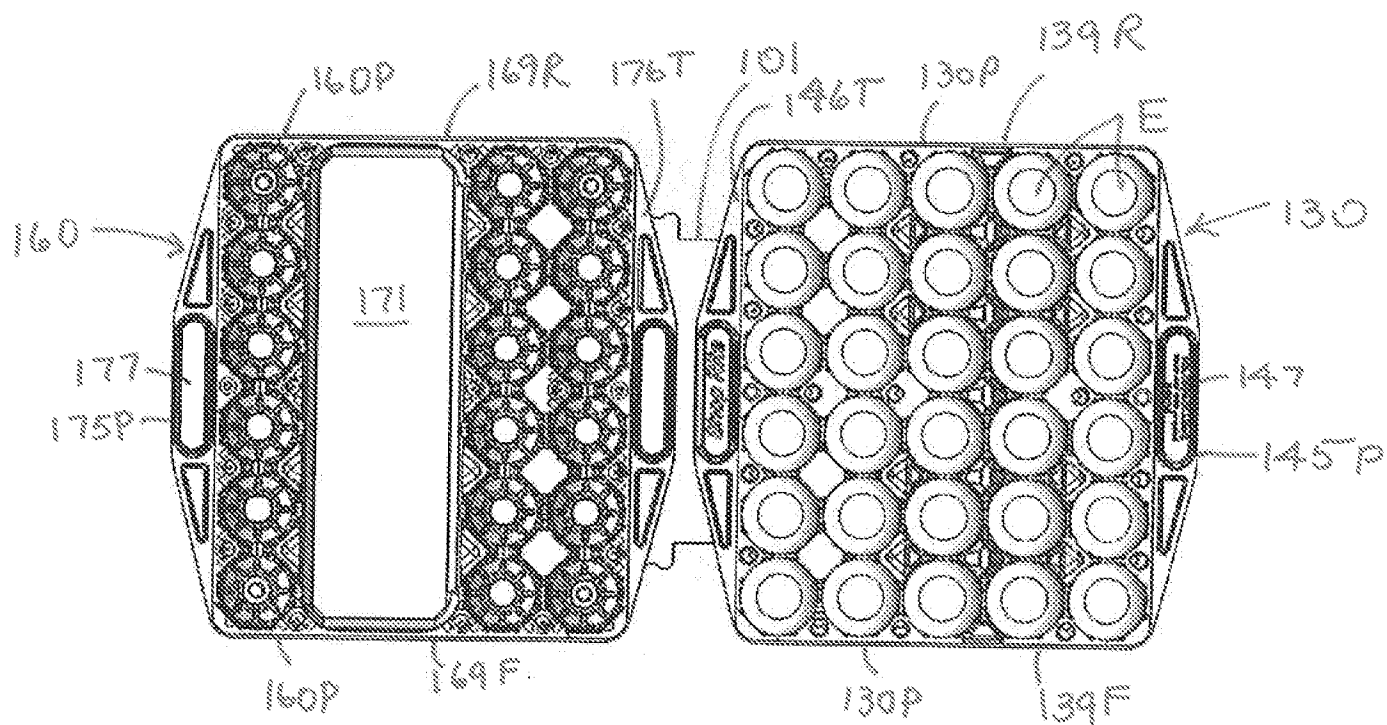
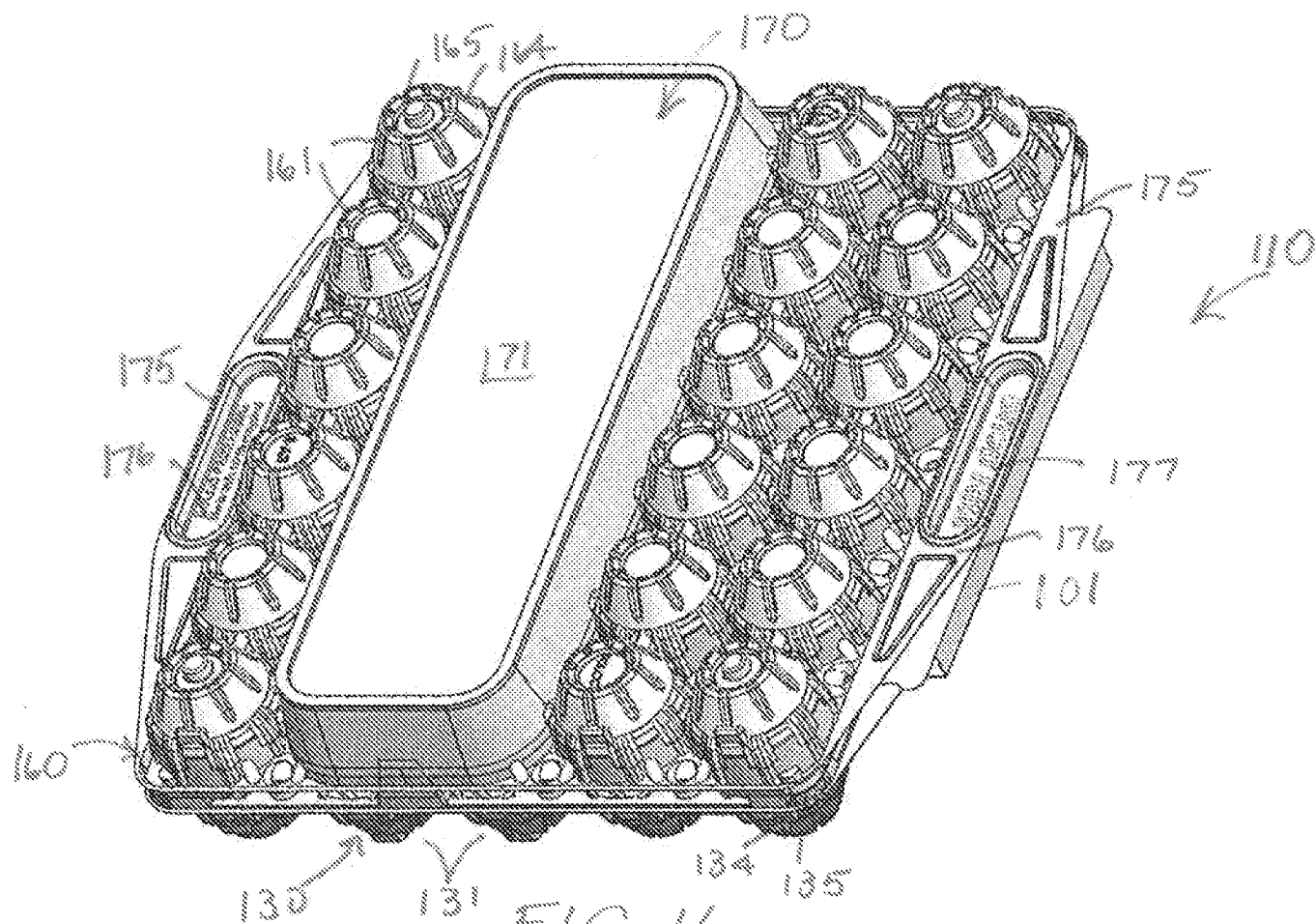
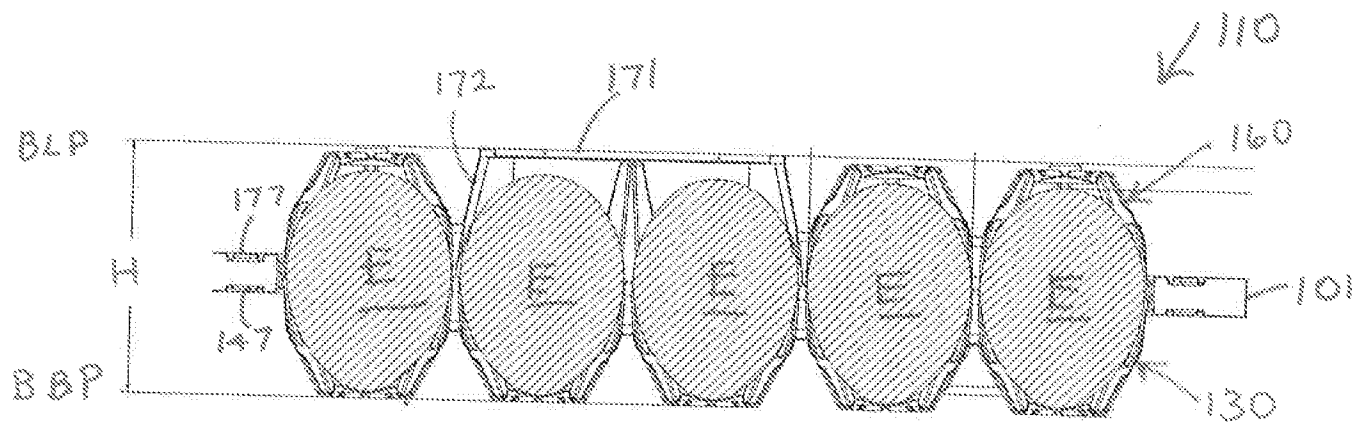
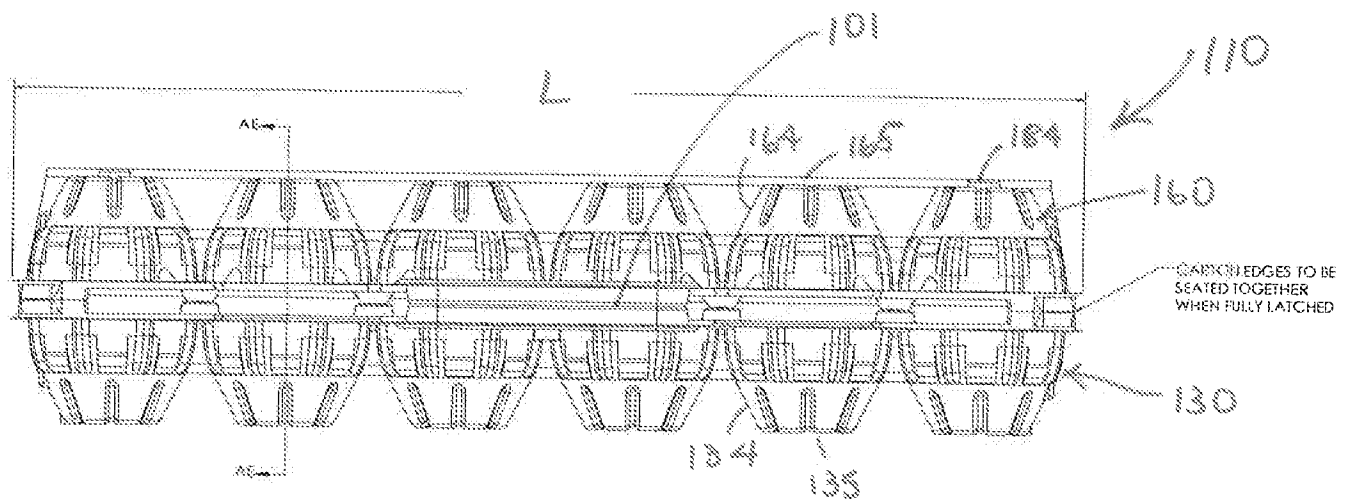


FIG. 15





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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	T12-7135US0 085093-681330
		Application Number	
Title of Invention	Egg Carton with Dual Handles		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2:

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	---

Inventor Information:

Inventor 1					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Babu		Kuruvilla			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	Duluth	State/Province	GA	Country of Residence	US	
Mailing Address of Inventor:						
Address 1	2707 Knox Creek Road					
Address 2						
City	Duluth	State/Province	GA			
Postal Code	30097	Country	US			
Inventor 2					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Rafael		Rivera			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	Dacula	State/Province	GA	Country of Residence	US	
Mailing Address of Inventor:						
Address 1	3374 Ridge Manor Way					
Address 2						
City	Dacula	State/Province	GA			
Postal Code	30019	Country	US			
Inventor 3					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Roger		Lichtle			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	T12-7135US0 085093-681330	
		Application Number		
Title of Invention	Egg Carton with Dual Handles			

City	Decatur	State/Province	IN	Country of Residence	US
-------------	---------	-----------------------	----	-----------------------------	----

Mailing Address of Inventor:

Address 1	3370 N. Shady Lane				
Address 2					
City	Decatur	State/Province	IN		
Postal Code	46733	Country	US		

Inventor 4	Remove
Legal Name	

Prefix	Given Name	Middle Name	Family Name	Suffix
	Mark	A.	Bergeron	

Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service

City	Monroe	State/Province	GA	Country of Residence	US
-------------	--------	-----------------------	----	-----------------------------	----

Mailing Address of Inventor:

Address 1	3040 Glenview Lane				
Address 2					
City	Monroe	State/Province	GA		
Postal Code	30656	Country	US		

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button.

[Add](#)**Correspondence Information:**

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence information of this application.			
Customer Number	21127		
Email Address	patentdocketing@polsinelli.com	Add Email	Remove Email

Application Information:

Title of the Invention	Egg Carton with Dual Handles		
Attorney Docket Number	T12-7135US0 085093-681330	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	9	Suggested Figure for Publication (if any)	1

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	T12-7135US0 085093-681330
		Application Number	
Title of Invention	Egg Carton with Dual Handles		

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY MM DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

Request Not to Publish. I hereby request that the attached application not be published under

☐ 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number			

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	T12-7135US0 085093-681330
		Application Number	
Title of Invention	Egg Carton with Dual Handles		

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	T12-7135US0 085093-681330
		Application Number	
Title of Invention	Egg Carton with Dual Handles		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	T12-7135US0 085093-681330
		Application Number	
Title of Invention	Egg Carton with Dual Handles		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
Applicant 1			
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.			
Clear			
☒ Assignee		☐ Legal Representative under 35 U.S.C. 117	
☐ Person to whom the inventor is obligated to assign.		☐ Joint Inventor	
☐ Person who shows sufficient proprietary interest			
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor:			
If the Applicant is an Organization check here. ☒			
Organization Name	Tekni-Plex, Inc.		
Mailing Address Information For Applicant:			
Address 1	460 E. Swedesford Road		
Address 2	Suite 3000		
City	Wayne	State/Province	PA
Country	US	Postal Code	19087
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	T12-7135US0 085093-681330
		Application Number	
Title of Invention	Egg Carton with Dual Handles		

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	T12-7135US0 085093-681330
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Title of Invention	Egg Carton with Dual Handles		

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ABSTRACT

An egg carton having base and lid trays that when disposed in vertical alignment (with the lid tray on top of the base tray) form a closed egg carton. The base and lid trays each include a pair of mating handle components, such that when assembled to form a closed carton provide both enhanced strength and ease of carrying the assembled carton. The handles also facilitate handling of the base and lid trays separately during manufacture, packing and transport, and during and after filling the base with eggs. The new base, lid and carton assembly are particularly useful when adapted for holding more than a dozen eggs, for example when holding 30 or more eggs in a rectilinear array of egg cells (arranged in linear rows and transverse linear columns), such as a 5 x 6 array of egg cells. The lid may further include a labeling area above a select portion of the base cells, the labeling area comprising a flat panel top wall and a depending sidewall forming an empty interior cavity below the top wall, for insertion of labeling material.

CLAIMS

1. A plastic base tray for packaging eggs, the plastic base tray comprising:
 - a) a thermoformed solid sheet of plastic comprising a top wall and a rectilinear array of recessed base cells arranged in rows and columns depending from the top wall, each base cell having an open top end, a sidewall and a closed bottom wall and being sized and shaped to hold one egg in a generally upright position with the long axis of the egg disposed in a vertical direction transverse to a base plane in which the bottom walls of the base cells reside;
 - b) the top wall surrounding the array having opposing front and rear edges and opposing left and right side edges; and
 - c) a pair of opposing handle flanges extending from the opposing left and right side edges to form an outermost perimeter of the base tray along with the opposing front and rear edges, each handle flange including a handle recess configured to be grasped by hand for lifting and transporting the base tray with the array of base cells filled with eggs.
2. The base tray of claim 1, wherein:
the handle flanges each define an outermost handle perimeter of the base tray in a width W direction, and the front and rear base tray edges define an outermost tray perimeter in a length L direction, transverse to the W direction, the distances between the respective outermost perimeters in the W and L directions being substantially equal and defining a square base tray footprint.
3. The base tray of claim 2, wherein:
the square base tray footprint is configured to fit within a shipping carton having a matching square interior cavity.
4. The base tray of claim 1, wherein:
the rectilinear base array comprises a 5 by 6 array of cells.
5. The base tray of claim 1, wherein:
each handle flange includes a supporting flange area surrounding the handle recess.
6. The base tray of claim 2, wherein:
the rectilinear base array comprises a 5 by 6 array of cells;
each handle flange includes a supporting flange area surrounding the handle recess, and the flange area has a reduced width from the square base tray footprint so as to define an open area within the square base tray footprint.

7. An assembly comprising the base tray of claim 1 and a mating plastic lid tray, the mating lid tray comprising:

d) a thermoformed solid sheet of plastic comprising a top lid wall and a plurality of lid cells depending from the top lid wall and arranged in a rectilinear array of rows and columns, each lid cell being aligned with one base cell and configured to cover an egg disposed in the aligned base cell;

e) the top lid wall surrounding the lid array having opposing front and rear lid edges and opposing left and right side lid edges; and

f) a pair of opposing lid handle flanges extending from the opposing left and right side lid edges to form an outermost perimeter of the lid tray along with the opposing front and rear lid edges, each lid handle flange including a lid handle recess aligned with an associated handle recess of the base tray and configured to be grasped by hand for lifting and transporting the assembly of the lid tray and the base tray with the array of base cells filled with eggs.

8. The assembly of claim 7, wherein:

the base tray and lid tray have mating components for maintaining vertical alignment of the each lid cell and associated base cell.

9. The assembly of claim 7, wherein:

the handle flanges of the lid tray each define an outermost lid handle perimeter of the lid tray in a width W direction, and the front and rear lid tray edges define an outermost lid tray perimeter in a length L direction, transverse to the W direction, the distances between the respective outermost lid perimeters in the W and L directions being substantially equal and defining a square lid tray footprint.

10. The assembly of claim 9, wherein:

the square base tray and lid tray footprints are configured to fit within a shipping carton having a matching square interior cavity.

11. The assembly of claim 7, wherein:

the rectilinear base array and the rectilinear lid array each comprise an aligned 5 by 6 array of cells.

12. The assembly of claim 7, wherein:

the rectilinear base array comprises a 5 by 6 array of cells;

each base handle flange and lid handle flange includes a supporting flange area surrounding the handle recess, and the flange area has a reduced width from the

square base tray footprint and so as to define an open area within the square base tray footprint.

13. The assembly of claim 7, wherein:

the base and lid trays have mating support posts disposed between the cells of the base and lid arrays for maintaining alignment of the mating base and lid cells.

14. The assembly of claim 7, wherein:

the lid tray includes a flat top wall label panel area without lid cells.

15. The assembly of claim 14, wherein:

the label panel area is disposed between rows of lid cells and between the front and rear lid edges.

16. The assembly of claim 7, wherein:

the base tray includes support posts for supporting the label panel area.

17. A stack of assembled base and lid trays according to claim 7, comprising a plurality of assembled base and lid trays aligned in a stack, with the aligned cells of the lid and base arrays aligned with a vertical stack axis.

18. A stack of assembled base and lid trays according to claim 9, comprising a plurality of assembled base and lid trays aligned in a stack, with the aligned cells of the lid and base arrays aligned with a vertical stack axis.

19. A carton containing the stack of assembled base and lid trays according to claim 18, wherein:

the square base tray and lid tray footprints are configured to fit within a matching square interior cavity of the carton.

20. The stack of claim 16, wherein:

the rectilinear base array comprises a 5 by 6 array of base cells.

21. The stack of claim 17, wherein:

the rectilinear base array and the rectilinear lid array each comprise an aligned 5 by 6 array of base and lid cells.

22. The stack of claim 16, wherein:

the rectilinear base array comprises a 5 by 6 array of base cells and the lid array comprises a 3 by 6 array of lid cells and a label panel area without lid cells..

23. The assembly of claim 7, wherein:

the base tray and lid tray are thermoformed from the same solid sheet of plastic and include a hinge connecting portion between the base tray and lid tray.

24. The assembly of claim 23, wherein:

the hinge portion extends between the base and lid handle flanges on the left of right sides of the aligned base and lid trays.

EGG CARTON WITH DUAL HANDLES

Field of the Invention

The present invention relates to plastic egg cartons having base and lid trays that together form a closed egg carton with dual carrying handles.

Background

Egg cartons are subjected to multiple adverse mechanical forces and environmental conditions during filling, handling and transport between distribution centers, store shelves, and the ultimate consumer's home. They typically encounter automated equipment for filling, packaging, loading, unloading, stacking, restacking and transport. During each of these encounters, the goal is to resist egg breakage by stabilizing and holding the eggs in a protected environment, in a carton that can be manufactured in a cost effective manner.

Thus, many factors are taken into consideration in the design of egg cartons. Egg protection, resistance to stress or force, stackability, transportability, moisture resistance, aesthetic appearance, print surface area, weight, nestability/denestability, adaptability to accommodate various size eggs, and consistent manufacturing are factors which may be considered to varying degrees in the design of an egg carton.

Plastic egg cartons are available with flexible walls between the cell pockets to protect the eggs and prevent them from moving into adjacent cell pockets. However, during handling, such as while loading cases of egg cartons onto a grocery pallet, and then stacking the cases 5 to 6 high on the pallet, the cases/cartons may be thrown onto the pallets and/or bump into each other, causing the eggs to come out of their cell pockets and make contact from a hard side impact blow. Also, when scanning bar codes on lid tops, the eggs can be displaced and/or make contact that damages the eggs.

Thus, there is need for an improved egg carton construction to provide better egg protection while encountering the adverse mechanical forces and environmental changes that typically occur during filing, packaging, transportation and storage. At the same time, there is a need to manufacture such cartons in a cost effective

manner and to maintain overall carton dimensions within standard case sizes to avoid a redesign of the existing handling equipment.

Summary of the Invention

In accordance with one embodiment of the invention a plastic base tray for packaging eggs, the plastic base tray comprising:

a) a thermoformed solid sheet of plastic comprising a top wall and a rectilinear array of recessed base cells arranged in rows and columns depending from the top wall, each base cell having an open top end, a sidewall and a closed bottom wall and being sized and shaped to hold one egg in a generally upright position with the long axis of the egg disposed in a vertical direction transverse to a base plane in which the bottom walls of the base cells reside;

b) the top wall surrounding the array having opposing front and rear edges and opposing left and right side edges; and

c) a pair of opposing handle flanges extending from the opposing left and right side edges to form an outermost perimeter of the base tray along with the opposing front and rear edges, each handle flange including a handle recess configured to be grasped by hand for lifting and transporting the base tray with the array of base cells filled with eggs.

In accordance with one embodiment of the invention the handle flanges each define an outermost handle perimeter of the base tray in a width W direction, and the front and rear base tray edges define an outermost tray perimeter in a length L direction, transverse to the W direction, the distances between the respective outermost perimeters in the W and L directions being substantially equal and defining a square base tray footprint.

In accordance with one embodiment of the invention the square base tray footprint is configured to fit within a shipping carton having a matching square interior cavity.

In accordance with one embodiment of the invention the rectilinear base array comprises a 5 by 6 array of cells.

In accordance with one embodiment of the invention each handle flange includes a supporting flange area surrounding the handle recess.

In accordance with one embodiment of the invention the rectilinear base array comprises a 5 by 6 array of cells;

each handle flange includes a supporting flange area surrounding the handle recess, and the flange area has a reduced width from the square base tray footprint so as to define an open area within the square base tray footprint.

In accordance with one embodiment of the invention an assembly comprising the base tray of claim 1 and a mating plastic lid tray, the mating lid tray comprising:

- a) a thermoformed solid sheet of plastic comprising a top lid wall and a plurality of lid cells depending from the top lid wall and arranged in a rectilinear array of rows and columns, each lid cell being aligned with one base cell and configured to cover an egg disposed in the aligned base cell;

- b) the top lid wall surrounding the lid array having opposing front and rear lid edges and opposing left and right side lid edges; and

- fc a pair of opposing lid handle flanges extending from the opposing left and right side lid edges to form an outermost perimeter of the lid tray along with the opposing front and rear lid edges, each lid handle flange including a lid handle recess aligned with an associated handle recess of the base tray and configured to be grasped by hand for lifting and transporting the assembly of the lid tray and the base tray with the array of base cells filled with eggs.

In accordance with one embodiment of the invention the base tray and lid tray have mating components for maintaining vertical alignment of the each lid cell and associated base cell.

In accordance with one embodiment of the invention the handle flanges of the lid tray each define an outermost lid handle perimeter of the lid tray in a width W direction, and the front and rear lid tray edges define an outermost lid tray perimeter in a length L direction, transverse to the W direction, the distances between the respective outermost lid perimeters in the W and L directions being substantially equal and defining a square lid tray footprint.

In accordance with one embodiment of the invention the square base tray and lid tray footprints are configured to fit within a shipping carton having a matching square interior cavity.

In accordance with one embodiment of the invention the rectilinear base array and the rectilinear lid array each comprise an aligned 5 by 6 array of cells.

In accordance with one embodiment of the invention the rectilinear base array comprises a 5 by 6 array of cells;

each base handle flange and lid handle flange includes a supporting flange area surrounding the handle recess, and the flange area has a reduced width from the square base tray footprint and so as to define an open area within the square base tray footprint.

In accordance with one embodiment of the invention the base and lid trays have mating support posts disposed between the cells of the base and lid arrays for maintaining alignment of the mating base and lid cells.

In accordance with one embodiment of the invention the lid tray includes a flat top wall label panel area without lid cells.

In accordance with one embodiment of the invention the label panel area is disposed between rows of lid cells and between the front and rear lid edges.

In accordance with one embodiment of the invention the base tray includes support posts for supporting the label panel area.

In accordance with one embodiment of the invention a stack of assembled base and lid trays according to claim 7, comprising a plurality of assembled base and lid trays aligned in a stack, with the aligned cells of the lid and base arrays aligned with a vertical stack axis.

In accordance with one embodiment of the invention a stack of assembled base and lid trays according to claim 9, comprising a plurality of assembled base and lid trays aligned in a stack, with the aligned cells of the lid and base arrays aligned with a vertical stack axis.

In accordance with one embodiment of the invention a carton containing the stack of assembled base and lid trays according to claim 18, wherein: the square base tray and lid tray footprints are configured to fit within a matching square interior cavity of the carton.

In accordance with one embodiment of the invention the rectilinear base array comprises a 5 by 6 array of base cells.

In accordance with one embodiment of the invention the rectilinear base array and the rectilinear lid array each comprise an aligned 5 by 6 array of base and lid cells.

In accordance with one embodiment of the invention the rectilinear base array comprises a 5 by 6 array of base cells and the lid array comprises a 3 by 6 array of lid cells and a label panel area without lid cells..

In accordance with one embodiment of the invention the base tray and lid tray are thermoformed from the same solid sheet of plastic and include a hinge connecting portion between the base tray and lid tray.

In accordance with one embodiment of the invention the hinge portion extends between the base and lid handle flanges on the left of right sides of the aligned base and lid trays.

BRIEF DESCRIPTION OF THE DRAWINGS

Figs. 1-3 illustrate one embodiment of an assembled base tray and lid tray for packaging eggs in aligned cells of the lid and base trays, wherein: Fig. 1 is an exterior top perspective view of the assembled base and lid trays forming the closed egg carton, as viewed from the front and right side of the carton, showing the flat top wall label panel area on the lid and the dual handles extending from the opposing right and left sides, respectively; Fig. 2 is a front plan view of the closed egg carton of Fig. 1; and Fig. 3 is a right side plan view of the closed egg carton of Fig. 1;

Figs. 4-6 illustrate further details of the base tray of Figs. 1-3, wherein: Fig. 4 is an exterior bottom plan view of the base tray; Fig. 5 is a front plan view of the base tray (aligned as shown in Fig. 2); Fig. 6 is a right side plan view of the base tray (aligned as shown in Fig. 3);

Figs. 7-9 illustrate further details of the lid tray of Figs. 1-3, wherein: Fig. 7 is an exterior top plan view of the lid tray; Fig. 8 is a front plan view of the lid tray (aligned as shown in Fig. 2); and Fig. 9 is a right side plan view of the lid tray (aligned as shown in Fig. 3);

Figs. 10-11 illustrate the base tray and lid tray of Figs. 1-3 in an unassembled state, wherein: Fig. 10 is a top perspective view of the interior of the base tray, and Fig. 11 is a bottom perspective view of the interior of the lid tray;

Figs. 12-13 and 13A illustrate a vertical stack of closed egg cartons, and a vertical stack of closed egg cartons disposed in a packing case (e.g., shipping container); Fig. 12 is an exterior top perspective view of an aligned vertical stack of two closed egg cartons; Fig. 13 is a front cross sectional view of an aligned vertical of four closed egg cartons disposed in a packing case having an interior cavity that matches the footprints of the lid and base trays of the closed cartons; and Fig. 13A is a top plan view of a stack of closed cartons in a packing case.

Figs. 14-15 illustrate the base tray and lid tray of Figs. 1-3 when filled with eggs, wherein, Fig. 14 includes perspective views of the unassembled lid and base trays, with the cells of the base tray filled with eggs, and Fig. 15 shows the subsequent assembled base tray and lid tray filled with eggs, showing the posts of the base tray supporting the interior cavity of the lid tray below the flat panel label area (without lid cells).

Figs. 16-19 illustrate another embodiment in which the lid and base trays have a hinge connection; Fig. 16 is a top perspective view of the lid and base tray with hinge connection in a closed position showing the hinge connection between the aligned right side handle flanges of the lid and base trays; Fig. 17 is a top plan view of the open carton showing the hinge connection in the open position between the lid and base trays; Fig. 18 is right side view showing the hinge connection and the mating base tray and lid tray edges seated together in the close carton position; and Fig. 19 is a vertical cross sectional view of the closed carton showing a row of 5 eggs, each egg disposed in a vertical position between an aligned base cell and lid cell (in 3 of the columns) and disposed in a vertical position between a base cell and the lid panel area (in 2 of the 5 columns), with the hinge connection in the closed position on the right side of the carton.

DETAILED DESCRIPTION

Separate Lid and Base Trays (Figs. 1-14)

In one embodiment, the present invention is directed to a two piece egg carton 10, comprising separate base and lid trays 30, 60 that when assembled in a stacked vertical alignment (with the lid tray on top of the base tray), form a closed egg carton. The base and lid trays each include a pair of mating handle components 45, 75, such that when assembled to form a closed carton provide both enhanced strength and ease of carrying the assembled carton. The handles also facilitate handling of the base and lid trays separately during manufacture, packing and transport, and during and after filling the base with eggs. The new base, lid and carton assembly are particularly useful when adapted for holding more than a dozen eggs, for example when holding 30 or more eggs in a rectilinear array of egg cells (arranged in linear rows and transverse linear columns), such as a 5 x 6 array of egg cells. The lid may further include a labeling area 70 above a select portion of the base cells, the labeling area comprising a flat panel top wall 71 and a depending

sidewall 72 forming an empty interior cavity 73 below the top wall, the cavity being without lid cells. Mating lid and base posts 32, 62 are provided for supporting the lid over the base, with extended height base posts 33 supporting the flat panel top wall.

These and other features of the present invention will be apparent from the following description of various embodiments.

As shown in the accompanying figures, Figs. 1-14 illustrate one embodiment of the present invention, wherein:

Figs. 1-3 illustrate exterior views of a base tray 30 and lid tray 60 assembled to form a closed carton 10 according to one embodiment, showing the dual mating handles 45, 75 on opposing side edges of the carton. Each of the base tray and lid tray have a generally rectilinear perimeter 30P, 60P in horizontal cross section, that when assembled form a generally rectilinear carton perimeter 10P in horizontal cross section, with mating opposing front and rear base/lid/carton edges 30F/60F/10F and 30R/60R/10R, and mating opposing right and left side base/lid/carton edges 30RS/60RS/10RS and 30LS/60LS/10LS.

Figs. 4-6 illustrate various views of the base tray (of Figs. 1-3) alone.

Figs. 7-9 illustrate various views of the lid tray (of Figs. 1-3) alone.

Figs. 10-11 illustrate interior views of the base and lid trays, respectively.

Figs. 12-13 illustrate two arrangements of stacked trays; Fig. 12 shows a pair of vertically stacked closed cartons; Fig. 13 shows four vertically stacked cartons disposed in a packing case; and Fig. 13A is a top view of a stack of closed cartons in a packing case.

Figs. 14-15 illustrate a base tray 30 filled with eggs in the cells 31 of the base tray, and a cross sectional view of the mating lid tray 60 fitted over the egg-containing base tray to form a closed (and filled) carton.

Base Tray (Figs. 4-6)

Figs. 4-6 show a plastic base tray 30 that provides a 5 x 6 rectilinear array of 30 base egg cells 31, each for holding a single egg E in a generally upright position (vertically aligned with the cell axis CA, as shown in Fig. 14). Each cell 31 is a cup shaped recess 33 formed by a sidewall 34 and bottom wall 35, the recess having an inner surface 33I that is sized and shaped to conform to the outer ovoid shape of a lower half of the egg that it gently supports in an upright position, shielding the egg from forces that impact the closed carton, as shown in Figs. 12-13 and 15. Each cell

bottom wall 35 has a flat annular portion 36 that lies in a horizontal bottom base plane BBP, allowing the base tray to sit flat on a store shelf (or on the exterior top wall of a lid of another closed carton on which it rests). The cells 31, 31 are joined by connecting walls 37 that extend between the cells and provide strength, stability and support, and the cells side walls 34 and bottom walls 35 themselves are reinforced by ribs or the like. The open top ends 38 of the cells all lie within a horizontal top base plane TBP defined by a top wall 39 of the base tray, the top wall having a generally rectilinear perimeter 39P, with a pair of opposing front and rear edges 39F and 39R, and a pair of opposing right and left side edges 39RS and 39LS (that extend between the front and rear edges respectively). The top base wall 39 includes, at the perimeter, one or more mating surfaces 39MS that align and mate with complementary mating surfaces 69MS on the lid tray, as described below. The base tray further includes cell posts 32, formed at the intersection of four cells, or along the perimeter at the intersection of two cells. The base cell posts are sized and shaped to mate with complementary lid posts 62 that extend downwardly from the lid, as described further below. There is a sub-group of elongated base cell posts 32E that are disposed beneath the open lid labelling area 70 (in the assembled carton); these are specially sized and shaped to engage the interior of the top wall 71 of the lid labeling area and support it from top compressive forces applied to the two top wall of the lid, so as to prevent such forces from either collapsing the closed carton or crushing the eggs in the open labeling area of the closed carton. In addition, there are base cell posts 32 aligned with the bottom of sidewall 72 of the lid labeling area, that engage and support the sidewall.

The base and lid trays 30, 60 each include a pair of mating handle components 45, 75, respectively, such that when the base and lid trays are assembled to form a closed carton (as shown in Figs. 1-3) the mating handles provide both enhanced strength and ease of carrying of the assembled carton. The handles also facilitate handling of the base and lid trays separately during manufacture, packing and transport, and during and after filling the base tray with eggs. Each handle (of the lid and base trays) comprises a handle flange 46, 76 surrounding a handle recess 47, 77 respectively, the handle recesses of the base and lid trays forming mating recesses that are configured to nest, one within the other, and provide an indented area that base be easily grasped by hand for lifting or carrying the assembled base and lid trays of a closed carton. The surrounding

handle flanges, here comprising an oval flange area 46O around the central oval handle recess 47 and two triangular flange areas 46T, 46T, each surrounding their own triangular recess 47T, disposed adjacent both ends of the oval flange area and extending toward the front and rear edges of the base or lid tray respectively. The handle flanges define an outermost handle perimeter 45P, 75P of the base or lid tray in a width W direction, while the front and rear base or lid tray edges 39F and 39R, 69F and 69R define an outermost tray perimeter 30P, 60P in a length L direction, transverse to the W direction, with the distances between the respective outermost perimeters in the W and L directions being substantially equal and defining a square base tray footprint. This provides the closed carton 10 with an outermost perimeter 10P sized to fit within and fill the square interior chamber of a packing case 90 for holding a 5 x 6 array of eggs (as further discussed below and shown in Figs. 12-13), the square footprint (in horizontal cross section) of the base/lid/carton 30/60/10 being configured to fit within a packing case having a matching square interior cavity 91 (in horizontal cross section).

Lid Tray (Fig. 7-9)

Figs. 7-9 show a plastic lid tray 60, sized and shaped to mate with the base tray 30, including a rectilinear array of lid cells 61 that matches the overall perimeter of the base cell array, but with fewer egg cells such that an open area 73 (free of egg cells) is provided in a 2 x 6 array portion of the lid to provide a labeling area in the top wall 71 of the lid tray. The interior open cavity 73 (surrounded by walls 71 and 72) allows a graphic printed label L as shown in Figs. 14-15, to be inserted into the cavity, lying along the flat panel top wall 71 and visible there-through when the lid is formed of a transparent plastic material. Alternatively, a separate label can be attached to the exterior surface of top wall 71, and the top wall itself can be embossed or printed with labeling information. The lid labeling area 70 has a length 70L extending between the front and rear edges of the lid tray, and a width 70W extending the width of two columns of egg cells, such that there is a single column of 6 egg cells between the left side of the labeling area 70LS and the left side of the lid array, and two columns of 6 egg cells each (for a total of 12 egg cells) between the right side of the labeling area 10RS and the right side of the lid tray. Each of the lid cells comprises a recess 63 configured to cover a single egg disposed in a generally upright position in the cell 31 of the base tray that is vertically aligned with the lid cell

61 (vertically aligned with the cell axis CA, as shown in Fig. 14). Each cell is formed by a sidewall 64 and bottom wall 65 forming a cup shaped recess 63, having an inner surface 63I that is sized and shaped to conform to the outer ovoid shape of an upper half of the egg that it gently supports in an upright position, shielding the egg from forces that impact the closed carton, as shown in Figs. 12-13 and 15. Each cell bottom wall 65 has a flat annular portion configured to lie in a horizontal lid base plane LBP when the lid sits on a flat supporting surface, and provides a flat surface on top of the lid of a closed carton when another closed carton rests on top of the lid. The cells 61, 61 are joined by connecting walls 67 that extend between the cells and provide strength, stability and support, and the cells themselves are reinforced by ribs or the like in the sidewalls and bottom walls. The open top ends of the cells all lie within a horizontal top lid plane TLP that defines a top wall 69 of the lid tray, the top wall having a generally rectilinear perimeter 69P, with a pair of opposing front and rear edges 69F and 69R, and a pair of opposing right and left side edges 69RS and 69LS (that extend between the front and rear edges respectively). The top lid wall includes, at the perimeter, one or more mating surfaces 69S that align and mate with complementary surfaces 39S on the base tray 30, as described above. The lid tray further includes cell posts 62, formed at the intersection of four cells, or along the perimeter at the intersection of two cells. The lid cell posts are sized and shaped to mate with complementary base posts 32 that extend upwardly from the base, as described above. There open lid labelling area has no lid posts and in the assembled carton is supported by the extended base posts 32E that support it from top compressive forces applied to the two top wall of the lid, so as to prevent such forces from either collapsing the closed carton or crushing the eggs in the open labeling area of the closed carton.

Lid and base trays in open position (Figs. 10-11)

Figs. 10-11 illustrate interior views of the base and lid trays 30, 60 respectively, in an open position, with the bottom wall 35 of the base tray 30 resting on a flat supporting surface and the top wall 65 of the lid tray 60 resting on another flat supporting surface. These views show a column of extended base tray cell posts 32E (5 full width posts, and two half width posts at the front and rear edges of the base tray 39F, 39R respectively, that will support the open lid labeling area 70, when the lid and base trays are in the closed position. This open view also shows the

mating handle recesses 47, 77 in the lid and base trays; in this embodiment the interior surface of the base tray handle recess 47 provides a label area (here shown with the name of a source or provider embossed into the surface). A pair of mating triangular recesses 47T, 77T are provided in the base and lid trays, adjacent opposing sides of the central handle recess 47O, 77O, to provide additional support and strength to both the open tray and closed carton. The open area 73 in the lid tray is a generally rectilinear shaped recess with flat bottom wall 71 (to receive a labeling insert L as shown in Figs. 12-13), visible through the lid top wall 71 when the tray is formed of transparent plastic, and a rectilinear sidewall 72 that surrounds the top wall for supporting the top wall.

Lid corner stabilizers 84 are provided in the bottom walls of the four lid cells to assist in retaining the lid and base trays in vertical alignment, and to withstand the application of transverse forces that would act to misalign the lid and base, and help prevent tipping when stacking a plurality of closed cartons for labeling, or placing on store shelves.. The lid and/or base trays may further include de-nesting lugs, positioned in the corners of the tray, to assist in handling the empty trays (e.g., removing one lid from a stack of lids for insertion of a label in the open lid area). See the de-nesting lugs 86 in the corners of the lid tray 60 shown in Fig. 7. Another optional feature is to provide smooth cell bottoms on at least some of the lid and base cells to adhere to suction cups (e.g., to hold in position during de-nesting and/or labeling.

Stacked Trays, and Packing Container (Figs. 12-13, 13A)

Figs. 12-13 and 13A illustrate two arrangements of stacked trays. In Fig. 12, two closed cartons 10-A and 10-B are vertically stacked, with the bottom surfaces 35 of the base tray cells of the upper carton 10-B, resting on the top surfaces 65 of the lid cells and lid labeling area top wall 71 of the lower carton 10-A. In Fig. 13, four vertically stacked closed cartons 10-A, 10-B, 10-C and 10-D are disposed in an interior cavity 91 of a packing container 90, the interior cavity having a square horizontal cross section configured to receive/engage the outer perimeters 10P of the four stacked cartons, so as to hold them securely in the vertical stacked arrangement during shipment and handling in the case. The case 90 has carrying handles 92 on the various sidewalls of the case, near an open top end 93. Fig. 13A, shows a top view of the case 90 containing one or more vertically stacked cartons

10, enabling a user can reach into the case from the open top end 93 to remove one or more closed cartons by inserting their hands along opposing left and right sides of the cartons, more specifically in the open areas (gaps) between the interior sidewall surface of the case and the tapered left and right flange areas of the carton in order to reach under the dual handles of the closed cartons.

One advantage of the present embodiment is that a stack of closed cartons 10, each with a 5 x 6 array of egg cells, fits within an interior chamber of a standard packing case, having a square horizontal cross section of 12 inches x 12 inches. In contrast, the prior art egg cartons with a 5 x 6 array of egg cells leaves a gap between the exterior edge of the carton (at its widest extent) and the interior sidewall of the case; this gap allows movement of the closed cartons in the stack which can damage the cartons and eggs during transit and handling. In contrast, the dual handles of the present embodiment eliminate the gaps between the widest extent of the carton in each of the L and W directions and the interior sidewall of the case, thereby eliminating detrimental transverse movement of the cartons in the stack and reducing or eliminating such damage to the cartons and eggs. The dual handles facilitate ready removal of the closed cartons from the interior chamber, supporting the carton(s) in a horizontal plane during insertion and removal from the cartons, again reducing damage to the cartons and eggs.

Filled base tray and lid tray in open position, and closed position (Figs. 14-15)

Figs. 14-15 illustrate a base 30 filled with eggs E in the cells 31 of the base tray, and a cross sectional view of the mating lid 60 fitted over the egg-containing base tray to form a closed (and filled) carton 10. The base holds 30 eggs in a 5 x 6 array, each egg E held securely in an upright vertical position (aligned with a central vertical cell axis of the aligned vase and lid cells) in an individual base cell. In Fig. 15 the lid tray 60 is shown over the filled base tray 60 in the closed position. The cross section of Fig. 15 is taken through the open labeling area 70, showing the open area 73 above the filled base cells and a separate paper label L positioned in the interior of the label area 73 adjacent the interior of the top wall 71.

Lid and Base Trays with Hinge Connection (Figs.16-19)

Figs. 16-19 illustrate another embodiment in which the lid and base trays have a hinge connection; Fig. 16 is a top perspective view of the lid and base tray with hinge connection in a closed position showing the hinge connection between the aligned right side handle flanges of the lid and base trays; Fig. 17 is a top plan view of the open carton showing the hinge connection in the open position between the lid and base trays; Fig. 18 is right side view showing the hinge connection and the mating base tray and lid tray edges seated together in the close carton position; and Fig. 19 is a vertical cross sectional view of the closed carton showing a row of 5 eggs, each egg disposed in a vertical position between an aligned base cell and lid cell (in 3 of the columns) and disposed in a vertical position between a base cell and the lid panel area (in 2 of the 5 columns), with the hinge connection in the closed position on the right side of the carton.

In Figs. 16-19, the various components of the base and lid trays are labeled with corresponding reference numbers in a "100 series" of number compared to those components in the first embodiment, with the integral carton of Figs. 16-19 labeled 110 and the hinge connection labeled 101.

Materials and manufacture

In one embodiment of the present invention, the base tray and lid tray are made of a solid thermoplastic material, such as a polyester, and more preferably a transparent thermoplastic material enabling a customer to view the eggs and/or labeling material inside of the closed carton. A suitable polyester is polyethylene terephthalate (PET), including both homopolymers and copolymers, virgin and recycled materials. Each of the lid and base trays can be molded from a solid sheet of polyester, for example by pressing the solid sheet between male and female dies to form the base cells (or lid cells and label area) and other structural and/or ornamental features of the base tray (or lid tray or integral base and lid trays with hinge connection), and then removing (trimming) any remaining portions of the sheet to form the base tray (or cell tray, or integral cell and base tray with hinge connection). Other suitable plastic materials for forming a solid lid and base trays include polyolefin (e.g., polyethylene (PE), polypropylene (PP)), and poly(lactic acid (PLA), including homopolymers, copolymers, mixtures and blends thereof, and including virgin and reclaimed (recycled) materials. In some embodiments, the plastic lid and/or base trays are opaque (not transparent).

According to one embodiment, each of the lid and base trays comprises a formed sheet of clear solid polyester having a thickness in a range of about 0.013 to about 0.022 inches.

According to one embodiment, each base cell has a vertical cell axis, aligned with the long axis of the egg and perpendicular to the base plane in which the bottom walls of the base cells reside, and an outwardly bowed sidewall portion sized to receive a major horizontal cell diameter (transverse to the long axis) of the egg.

According to one embodiment, the assembled carton holds 30 eggs in a 5 x 6 matrix of cell pockets (formed by the aligned base and lid cells, or the aligned base cells and lid panel area), the carton having an overall length of from about 11.6 to about 11.8 inches, a width of from about 11.6 to about 11.8 inches and a height of from about 2.6 to about 2.8 inches, at the respective outmost perimeter portions.

According to one embodiment, a plastic egg carton is provided having structural features that enable packaging of larger size eggs, e.g., large, extra-large, or jumbo eggs in a 5 x 6 array, in both oriented and non-oriented positions, while allowing for easy filling, closing, handling and packing into shipping containers. As used herein, large eggs fall in a weight range of about 54-61 grams per egg, extra-large eggs fall in a range of about 61-68 grams per egg, and jumbo eggs fall in a range of about 68-77 grams per egg. The carton may be configured to hold a variety of smaller sized eggs, namely small (about 40-47 grams) or medium eggs (about 47-54 grams), and alternative super jumbo eggs (greater than about 77 grams). Preferably, the carton can be used with standard egg grade equipment and the carton will fit into standard cases (containers, such as corrugated paper, wire or plastic cases) designed for holding a plurality of egg cartons.

In accordance with one embodiment of the invention, the assembled base and lid trays form a plurality (e.g., a 5 x 6 array) of individual egg cell pockets that can accept the larger, heavier and more fragile extra-large eggs in both oriented (large diameter down toward the bottom of the base cell) and non-oriented (larger diameter up toward the top of the base cell) positions, versus prior art containers that require a correct (oriented, larger diameter down) positioning in the cells. The base and lid trays include a larger cell construction able to hold an extra-large egg that is non-oriented, i.e., enabling the largest diameter of the egg to fit into the base cell). By accommodating both oriented and non-oriented eggs, this allows more efficient processing, carton handling and placement into master containers (packing cases).

An apparatus and method for making solid plastic trays are known, for example including a female mold cavity and a plug assist for pressure forming a base tray or lid tray with a turned up lip edge, in the mold. A continuous sheet of plastic is fed to the mold and is formed by the plug assist pushing the sheet toward the female cavity in combination with the application of a vacuum on the exterior side of the sheet/carton to draw the sheet into the recesses of the mold cavity. The formed carton is then trimmed at a separate trim station, where the tray is positioned between the female die cavity and a cutting edge punch having a knife edge, the cavity and punch being brought together to sever (cut) the lip edges from the sheet to form the terminal ends of the lip edges, in a direction aligned with the vertical height H direction of the carton. Other forming and trimming methods known to those skilled in the art can be used for forming the carton and turned up lip edge of a base or lid tray according to the present invention.

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	SUB-2021-04-28_Transmittal_085093-681330.pdf	290428	no	2
			9e8230c6487d2024f2122a441b28ec46db2bc34e		
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2	Drawings-only black and white line drawings	DRW-2021-04-28_Drawings-as-Filed_085093-681330.pdf	2691902	no	9
			d91bec2cbe0b66edfaabd94d880745d641b6099ac		
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3	Application Data Sheet	ADS-2021-04-28_Application-Data-Sheet_085093-681330.pdf	116739	no	9
			2c4eabb466e843412c66ab9e9b22ec7af56d8b5		
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4		APP-2021-04-27_Application-as-Filed_085093-681330.pdf	106189	yes	20
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	Abstract		20	20	
	Claims		16	19	
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5	Fee Worksheet (SB06)	fee-info.pdf	38591	no	2
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Application Number: 17242350

Document Date: 04/28/2021

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