Aug. 8, 1967 C. W. MODERSOHN 3,334,765

EGG CARRIER

Filed May 4, 1965 3 Sheets-Sheet 1

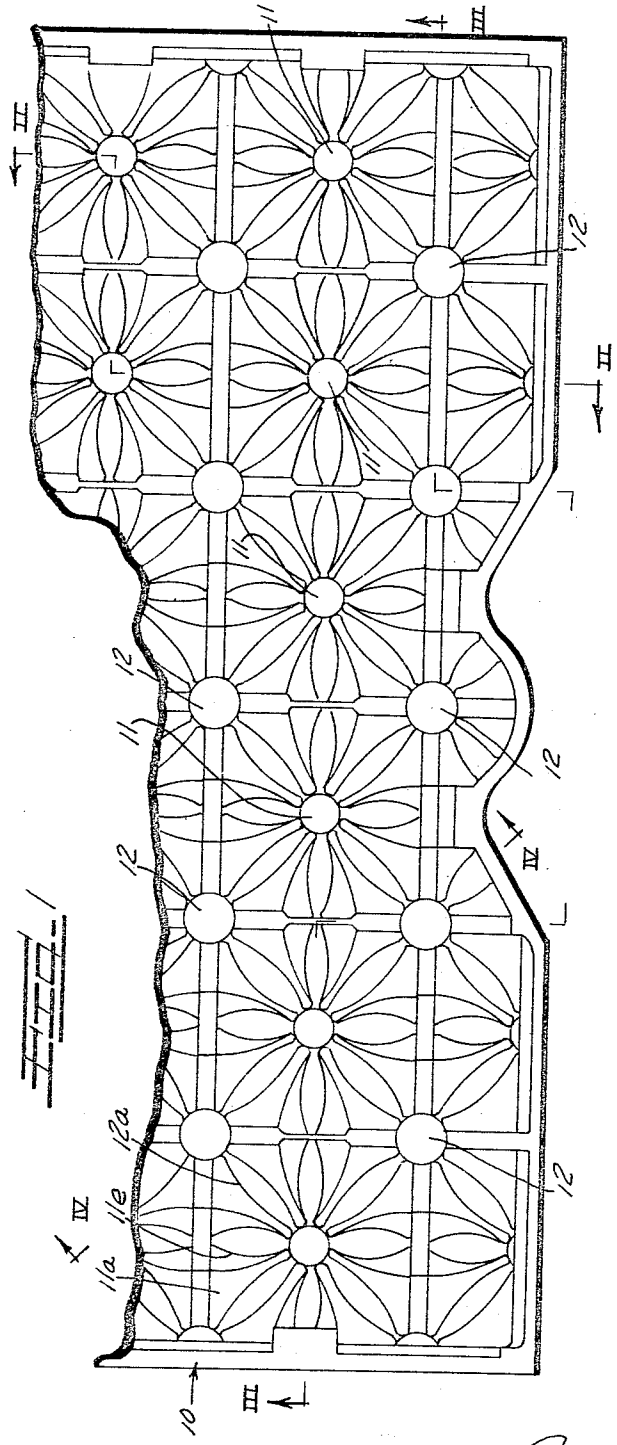



FIG. 1

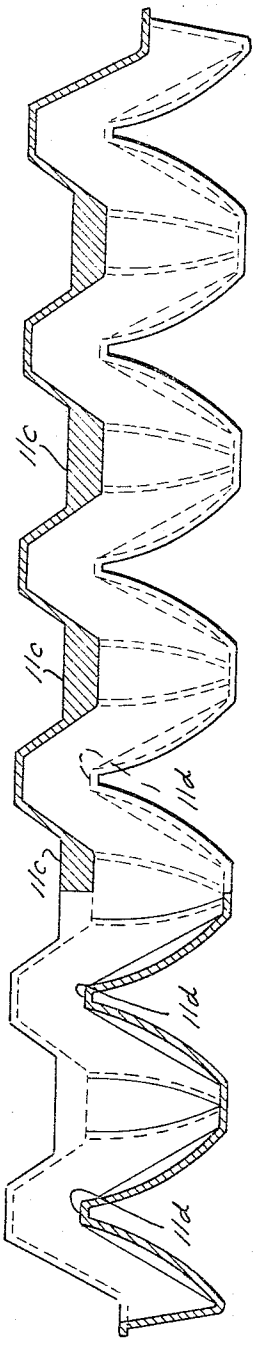



FIG. 2

INVENTOR.
CHARLES W. MODERSOHN

BY Hill, Sherman, Meroni, Gross & Simpson ATTORNEYS

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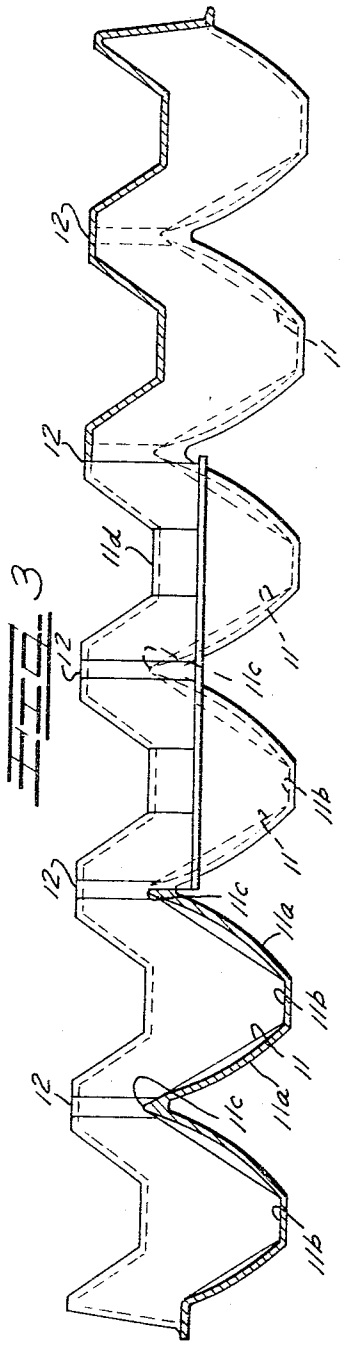



FIG. 3

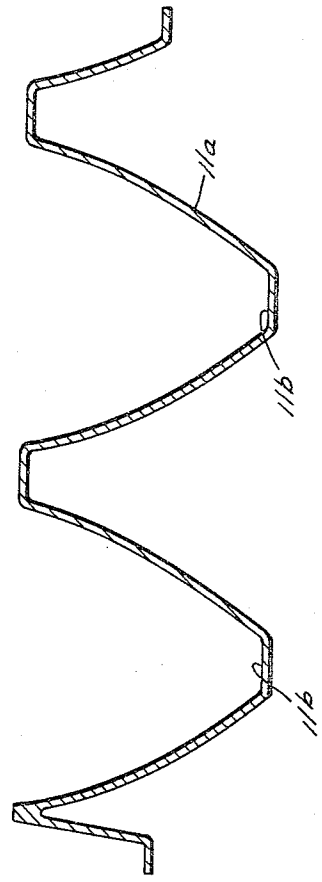



FIG. 4

INVENTOR.
CHARLES W. MODERSOHN
BY
Kill, Sherman, Morsell, Gross & Simpson
ATTORNEYS

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EGG CARRIER

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FIG. 5

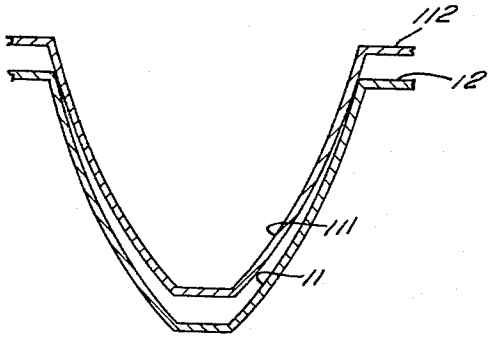



FIG. 6

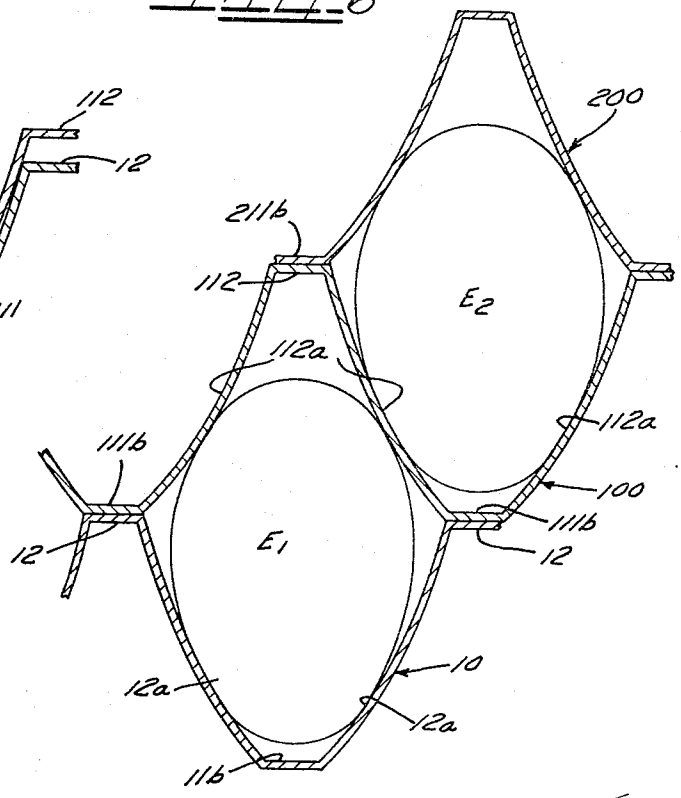
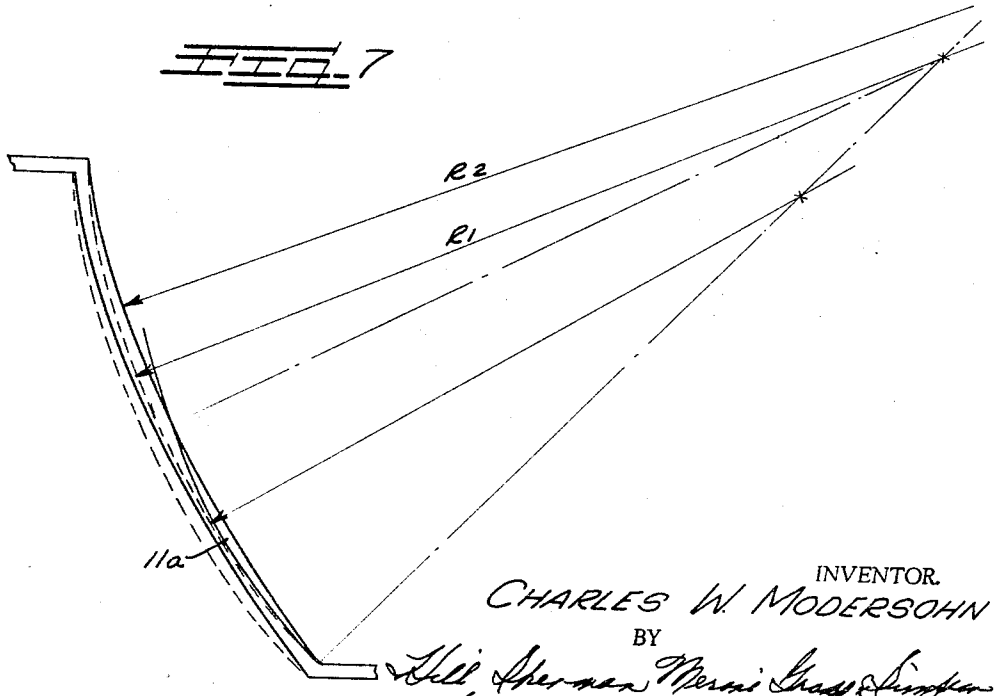



FIG. 7




INVENTOR.
CHARLES W. MODERSOHN
BY
Hill, Sherman, Meroni, Gross & Simpson
ATTORNEYS

United States Patent Office

3,334,765
Patented Aug. 8, 1967



3,334,765

# EGG CARRIER

Charles W. Modersohn, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis., a corporation of Wisconsin

Filed May 4, 1965, Ser. No. 453,012
1 Claim. (Cl. 217—26.5)

The instant invention relates to a pulp molded article, and more particularly, to an egg carrier or similar packaging device.

Although it has been the practice for many years to ship eggs in crates, with the eggs being packed in layers, this practice has now become outmoded and egg trays or similar packaging devices such as are shown, for example, in such patents as Manson U.S. Patent No. 2,345,274 and Putnam U.S. Patent No. 2,662,659 have found use in this art. These articles are molded from pulp, in pulp molding machines, and are found to be particularly useful for the reasons already set forth in the patents of record, which include resilient mounting for the eggs carried thereby as well as the ability of these articles to rest in superimposed positions with the various elements thereof nested or seated within each other so as to reduce the total vertical dimension for a multiplicity of such packaging materials. The advantages are many and need not be repeated in great detail herein, but the various shapes and arrangements for such carriers are also many and their differences are significant in character.

In the practice of the instant invention a certain simplified pulp molding shape has been provided whereby the pulp may be readily molded into the form of the desired packaging device or egg tray and the egg tray itself has certain unusual advantages in simplification of molding, simplification of handling, and the handling of eggs or similar spheroidal types of articles which may be mounted or carried therein.

It is, therefore, an object of the instant invention to provide a simplified and sturdy structure for mounting eggs or similar spheroidal articles.

It is another object of the instant invention to provide an improved structure for egg trays.

Yet another object of the instant invention is to provide an improved yet simplified, egg tray structure wherein molding is greatly simplified and at no sacrifice to the mounting or carrying of eggs in the manner desired.

On the drawings:

FIGURE 1 is a top plan view of a fragmentary portion of an egg tray employed in the practice of the instant invention;

FIGURE 2 is a sectional, elevational view taken substantially along the line II—II of FIGURE 1;

FIGURE 3 is a sectional elevational view taken substantially along the line III—III of FIGURE 1;

FIGURE 4 is a view taken substantially along the line IV—IV of FIGURE 1, also in elevation;

FIGURE 5 is a view taken also substantially in elevation showing fragmentarily a portion generally of the type shown in FIGURE 4, but showing portions of two nested trays empty;

FIGURE 6 is another view taken substantially along the lines of FIGURE 4, but showing in fragmentary elevational section a plurality of egg trays with eggs mounted therein; and

FIGURE 7 is a view taken generally along the lines of the views of FIGURES 2 and 4 so as to show the general superimposition of the contours in elevation of the contours of the pulp walls defining the pulp tray posts and cup walls.



As shown on the drawings:

Referring in detail to the drawings, wherein similar reference numerals show generally similar elements, it will be seen that, as shown in FIGURE 1, the egg tray of the invention is indicated generally in its fragmentary view by the reference numeral **10** and it consists of a suitable material such as pulp which is molded to provide a myriad of generally symmetrically disposed hollow conical cup portions, indicated at **11**, each surrounded by four post elements indicated generally at **12**. As indicated in FIGURE 2, the relative positions of the cup portions **11** and the posts **12** is also shown. It will be appreciated that when a tray is superimposed above the tray **10** shown in FIGURE 1, the cup portions **11** will nest in the cup portions **11** of those already shown in FIGURES 1 and 2 so that the total vertical dimension of the two egg trays will be substantially less than the sum of the vertical dimensions of the two. This is shown fragmentarily in FIGURE 5, in which the superimposed tray is indicated by the same reference numerals in the 100 series.

It will be appreciated that the egg cup portion **11** indicated in FIGURES 2 and 4 for individual cups comprises a shape that is generally that of a truncated cone in which the sides **11***a* have a definite curvature (the radius of which $R_1$ is indicated as being relatively large in the fragmentary view of FIGURE 7); whereas the bottoms indicated at **11***b* are in simplified generally flat form for convenience in molding. It will be appreciated that the bottom of any egg or similar spheroidal article has a definite curvature and certain prior art devices have attempted to conform generally with such curvature; but it will be seen from FIGURE 6 hereof that the flat bottom **11***b* is not really intended to engage the bottom of an egg (indicated at $E_1$), whereas the walls **11***a* will engage the curved sides of the egg $E_1$ and receive the same with comparative ease. In addition, it will be noted that the superimposed walls **112***a* and **112***a* indicated in FIGURE 6 engage the upper portion of the curved surfaces of the egg $E_1$ while simultaneously engaging the lower portions of the superimposed egg $E_2$ but these wall portions do not interfere with the positioning of the eggs in either the lower tray **10** or the first superimposed tray **100** (or the second superimposed tray **200**). These walls **12***a* and **112***a* for the cup portions **11** and **111** will thus readily receive the superimposed eggs $E_1$ and $E_2$ without interference with each other and without interference with the convenient seating or resilient mounting of the eggs $E_1$ and $E_2$. The resilient seating or mounting of the eggs $E_1$ and $E_2$ is important in that the eggs must be so positioned that they can withstand a certain amount of jarring or shaking which is a characteristic of the mounting of eggs in egg trays of any type. In addition, it will be seen from FIGURE 6 that the flattened top post **12** engages generally the flattened bottom portion **111***b* of the immediately superimposed tray **100** so as to provide a footing or mounting for the two superimposed trays and the post portions **112** at their tops also engage the bottom portions of the next superimposed flattened truncated cone portion **211***b* for the third tray, as shown in FIGURE 6.

It will further be seen that the cup walls **11***a* as indicated in FIGURE 4 are generally in the form of surfaces of revolution about a central axis that is generally

perpendicular to the central portion of the flattened truncated flat bottom **11***b*. This is consistent with the general shape of the oblate spheroid, which is the shape of eggs. The actual radius involved for the side walls **11***a* is indicated as the radius $R_1$ in FIGURE 7. It will be appreciated, however, that the radius $R_1$ relates to the general surface of revolution which defines the lower cup walls **11***a* which in turn merge at relatively lower peaks **11***c* (as indicated for example in FIGURE 2). At these relatively lower peaks **11***c*, it will be seen that their elevation is approximately at the midpoint in the elevation of an upright egg $E_1$ or $E_2$, but not necessarily so. For example, referring to the dimensions in FIGURE 2 it will be seen that the overall vertical height of the single tray shown in FIGURE 2 is approximately 1⅞ inches, whereas the dimension $H_2$ which extends from the flattened post top downwardly to below these relatively pointed top portions **11***c* is approximately one inch and the dimension $H_2$ which extends from the flattened post top downwardly to approximately the top of such pointed upwardly extending separating points or ridges **11***c* is approximately ⅝ inch, so that the separating points do extend substantially above the half-way mark in the height of the individual tray, but the egg itself does not mount itself in the individual tray (as indicated in FIGURE 6) in such a way as to seat completely against the bottom **11***b* of the cup portion. Nevertheless, the egg $E_1$ or $E_2$ is so seated in the cup portions that it does not rock or move perceptibly or at least in such a manner as to be damaged. The upwardly pointed sections **11***c* are opposed to each other, as shown in FIGURE 2, and again as shown in side elevation in FIGURE 3; whereas the opposite sides of the cup tend to rise to relatively less pointed pulp sections **11***d*, as indicated best in FIGURE 2 and the levels for the portions **11***d* are somewhat below the pointed pulp filled ridges **11***c*, but still sufficiently high to assure the secure mounting of the eggs in the individual trays.

Referring now briefly to the top plan view shown in FIGURE 1, it will be seen that the surface of revolution is indicated in the left hand cup at **11***a* and this surface of revolution **11***a* is a surface that is defined by a smaller radius body surface that is most remote from the center axis rising vertically from the central portion of the flat truncated bottom **11***b* of each cup. This is also shown in FIGURE 7 in that the radius $R_1$ for the surface of revolution **11***a* for the overall cup walls is relatively less than the radius $R_2$ which defines the inner surface for the cup portions which extend downwardly from approximately the tops of the post **12** to the flattened truncated portion **11***b* and which regions are indicated at **12***a* in the left hand cup of the top plan view of FIGURE 1 as well as being indicated by the radius $R_2$ in FIGURE 7. Substantially the same radius $R_2$ is employed in defining the generally flattened portions indicated in the left hand cup in the top plan view of FIGURE 1 at **11***e* for the opposed sides which rise to the top ridges previously indicated at **11***d* in FIGURE 3. This provides really a resilient four point mounting for the egg on the flattened regions extending downwardly from the posts (indicated by the reference numeral **12***a*), to which are added two more possible points by the regions **11***e*, as indicated in FIGURE 1. It will be appreciated that there is a remote chance, however remote, that a given egg will have the exact dimensions which would cause it to seat at all six points uniformly, but this chance is too remote to be concerned with.

Instead, it is more important that the post **12** which provides the greatest strength for the individual trays **10**, **100**, **200**, etc. also provide the flattened surfaces **12***a*, etc. which extend inwardly into the area defined by the general surface of revolution originally defining the cup (which would be the surface **11***a*), so that the flattened surfaces will tend to afford four point resilient mounting



for individual eggs in accordance wtih the particular dimentions thereof and this four point resilient mounting is provided by the strongest portion of the tray, so that observation of FIGURE 6 will reveal that the points of actual contact between the eggs $E_1$ and $E_2$ and the trays **10**, **100**, **200**, etc. should properly be defined by the reference numerals **12***a*, **112***a*, etc. rather than **11***a*, **111***a*, etc. since the eggs will actually contact the cups at these strengthened and flattened resilient points which extend inwardly into the cups **11** for purposes of supporting the eggs at the most strengthened portions of the cups **11**. It will also be appreciated that should these flattened portions **12***a*, **112***a*, etc. yield sufficiently then the egg will merely push outwardly so as to be supplementarily supported by other resilient portions of the general surface of revolution defined by the walls **11***a* hereinbefore described, which walls are also defined and described as being sufficiently closely positioned with respect to any given cup to provide adequate clearance at the top thereof (as indicated in FIGURE 6) to afford room for the top portion of the lower egg $E_1$ so that the actual resilient supporting of the individual egg is not necessarily carried out by the flattened post portions **12***a*, etc. although these portions will be the first to contact the egg surface, but at the same time one must appreciate that the various other wall portions of the cup at **11***a* beneath the median plane of the tray, which is approximately at the level of the bottom extreme of the dimension $H_2$ shown in FIGURE 3 will be able to supplement this supporting concept whenever required and the eggs are thus supplementarily supported whenever necessary by the entire cup. Again, it must be appreciated that the eggs themselves are not perfect oblate spheroids, even though the cup portions may be substantially uniform in their surfaces of revolution as defined by the radii $R_1$ and $R_2$ so that the eggs will not seat so uniformly in any given cup **11** that they would tend to stick there or give any real resistance to manual removal therefrom. The entire tray **10** being made of pulp is yieldable in character and will not resist manual grasping of eggs to remove the same from the tray whenever required, even though the individual trays **10**, **100**, etc. are capable of giving extremely good support to the eggs when mounted therein. It is thus an important consideration that the yieldability of the trays **10**, **100**, etc. be considered in the light of their formation from pulp and the ability to manually grasp and remove eggs therefrom should also be considered as an important factor. The manner in which the egg cup **11** is capable of supplementarily supporting eggs under higher pressures and/or extreme conditions is thus merely a distinct advantage which would be afforded under such pressures, but as soon as the pressures are relieved in the removing of eggs from the trays and the removing of superimposed trays, it will be appreciated that the eggs themselves will have a tendency to be resiliently forced back to their initial position of approximately resilient four or six point mounting so that their convenient removal is not interferred with in any way.

It will be understood that modifications and variations may be effected without departing from the spirit and scope of the novel concepts of the present invention.

I claim as my invention:

A plurality of egg trays in superimposed position, each of said trays being composed of a myriad of sections each having four posts extending upwardly to flattened tops adapted to support from beneath an immediately superimposed carrier, said four posts surrounding an egg cup structure generally being that of an inverted truncated cone with sides defined generally by a surface of revolution of generally a predetermined radius about a conical axis and the bottom being the truncated portion of such cone, there being a generally narrow flattened surface portion extending generally from the top

of each such four posts to such truncated bottom of the cup and also extending inwardly from the previously mentioned surface of revolution whereby the egg will tend to engage initially and resiliently at essentially only four points defined on said flattened surfaces in each cup section and the egg will tend to rest thus in such cup section with a top portion of the egg extending upwardly therefrom, and each post of each section defining a hollow central interior adapted to receive such top portion of the egg in the interior of a post of such superimposed carrier.



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THERON E. CONDON, *Primary Examiner.*

R. H. SCHWARTZ, *Assistant Examiner.*