March 27, 1956 G. S. WOLF 2,739,753

EGG CASE SEPARATOR

Filed Feb. 27, 1951

Fig. 1.

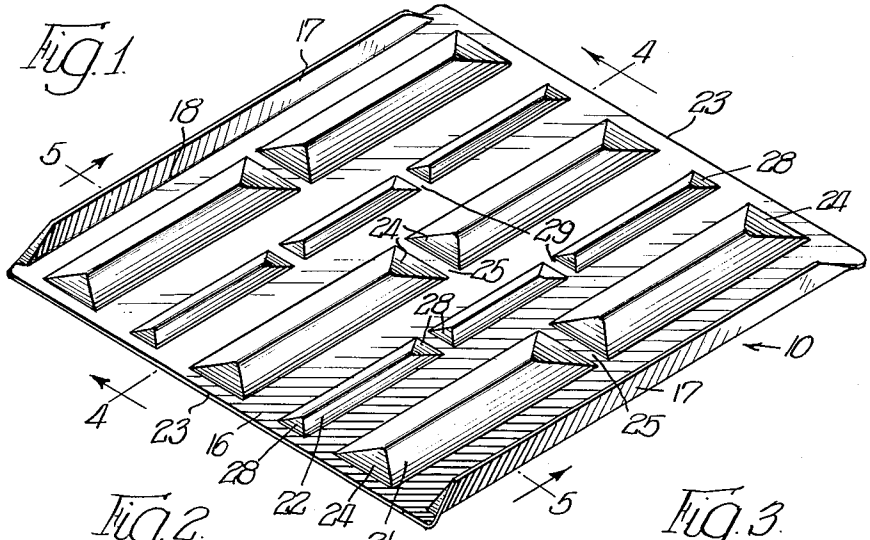


Fig. 2.

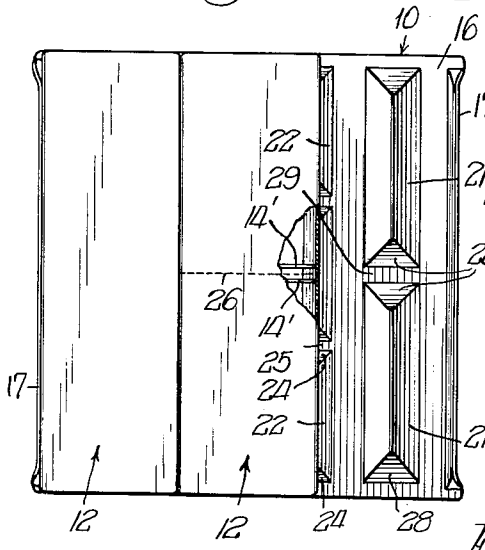


Fig. 3.

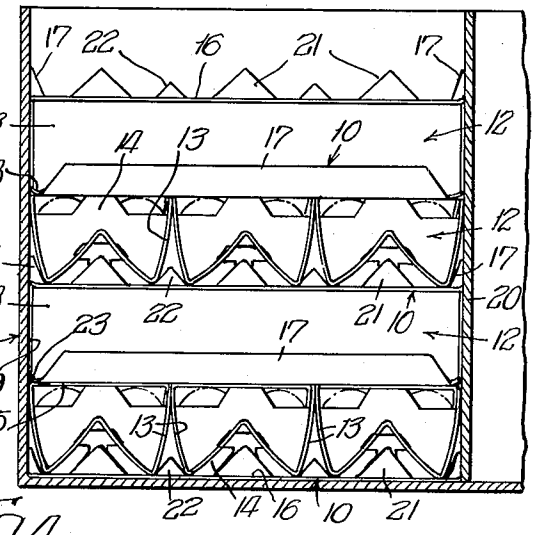


Fig. 4.

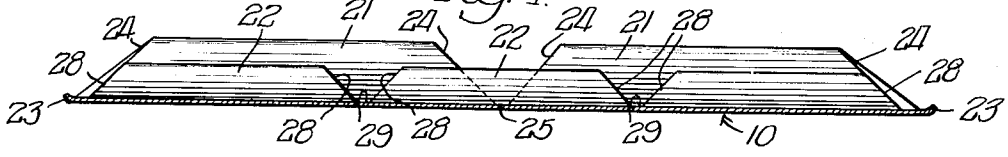




Fig. 5.

INVENTOR.
George S. Wolf,
BY
Cromwell, Wrist & Warden
Attys.

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EGG CASE SEPARATOR

George S. Wolf, New York, N. Y., assignor, by mesne assignments, to The Diamond Match Company, New York, N. Y., a corporation of Delaware

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4 Claims. (Cl. 229—42)

The present invention relates to an improved molded paper pulp separator and protector device for the case packing of cartoned eggs.

Egg shippers have of recent years increasingly adopted the practice of candling, grading and cartoning eggs in their own establishments, and of shipping the cartoned eggs in the same type of standard partitioned egg case or crate commonly used in making bulk shipments. For this purpose the eggs are packed in 2 x 6 style cartons, characterized by two rows of egg receiving cells, six cells in each row. They are commonly fabricated of paperboard, however molded pulp 2 x 6 style cartons of a recent improved design are also adapted to the case packing procedure referred to.

Known types of cellular filler and corrugated board flat units are employed to protect bulk crated eggs from breakage in transit, and the problem of devising appropriate means to protect with equal or better success cartoned eggs shipped in cases is now faced. Its solution is not reached by resorting to the use of known types of egg flats or separators. Not only must proper support and protective cushioning of the cartons be afforded, it is also necessary that the space occupied by the protective, carton separating means be kept at a minimum, in view of the additional bulk of the cartons themselves, in order that the case may contain its full and proper complement of eggs. This is usually thirty dozen, packed a dozen per carton.

Existing types of corrugated paper flats or separators are not acceptable for the purpose because they do not afford adequate protection and, in addition, their thickness is excessive. Only a very limited amount of space is available in the standard egg case, over and above the total volume of the thirty cartons. The same objection is present with certain other types of specially shaped egg separators. A carton separator fabricated of molded paper pulp is well suited for the above stated purposes, due to its inherent felted, cushion-like texture, coupled with a thickness which is not excessive. However, these qualities alone do not suffice for the proper protection of the fragile cartoned articles. Provision must be made to restrain the cartons against lateral shift such as would cause damaging impacts with one another or against the case walls. Leakage of the contents of eggs broken (notwithstanding the protection otherwise afforded by the separator) onto cartons therebelow, with resultant damage or defacement of the latter, is another condition which must be successfully met by a separator for the intended purpose. Finally, the separator must be one which is adapted to receive and properly protect cartons which are of a well-known, transversely divisible type, scored for manual separation into two halves of half-dozen capacity, as well as the non-divisible, dozen capacity cartons.

The present invention provides a protective support and separator for filled egg cartons packed in egg crates, which is molded from a watery slurry of paper pulp. The device is molded in a predetermined outline characterized by flat, coplanar surfaces on which the lower extremities of several cartons, arranged in a row, may rest. These surfaces are separated by integral, upwardly tapering abutments or cleats of varying height which engage opposite sides of the aforesaid carton extremities and prevent transverse shift of the respective cartons. Each carton is individually restrained in this fashion. Certain of the abutments are cleft transversely at their respective midpoints to accommodate the divisible as well as the non-divisible type carton. Upwardly projecting marginal lips or flanges on the separator serve to insure snug reception of the same in the egg case and to hold any leakage from spilling over onto the tier of cartons next below.

It is thus a general object of the invention to provide an improved molded paper pulp separator for cartoned and case-packed eggs which safely cushions a tier of transversely aligned cartons, a tier resting on a tier below and supporting a tier above, while affording a stable, flat surface upon which the cartons rest; which has improved provision for preventing lateral shift of the cartons under rough handling of the case, both as regards individual cartons of a tier and as regards shift of an entire carton and separator unit with relation to the case; and which is shaped in a fashion to prevent leakage of the content of broken eggs to a carton or tier of cartons therebeneath.

Another object is to provide a molded pulp separator of the above description which occupies a minimum of vertical space in a carton and has improved means to assume frictional bracing engagement with the walls and intermediate separator panel of a standard thirty-dozen egg case whereby to allow the case to be packed with a full intended quantity of eggs, even though they are packed in cartons, and to take up looseness or play of the cartoned units in the case.

The foregoing statements are indicative in a general way of the nature of the invention. Other and more specific objects will be apparent to those skilled in the art upon a full understanding of the construction and operation of the device.

A single embodiment of the invention is presented herein for purpose of illustration and it will be appreciated that the invention may be incorporated in other modified forms coming equally within the scope of the appended claims.

In the drawings:

Fig. 1 is a top perspective view of the improved separator device;

Fig. 2 is a top plan view showing a part of a carton and separator tier or unit, *i. e.*, including only two of the three cartons which it normally contains, this view being partially broken away and horizontally sectioned to indicate the adaptability of the separator as an adjunct to the case packing of both divisible and non-divisible types of egg carton;

Fig. 3 is a fragmentary view in vertical longitudinal section through a standard, thirty-dozen, carton loaded egg case or crate, illustrating the fashion in which the separators are assembled with cartons and case packed in use; and

Figs. 4 and 5 are, respectively, views in vertical section along lines corresponding to lines 4—4 and 5—5, respectively, of Fig. 1, further illustrating details of construction of the separator.

The separator of the invention is generally designated by the reference numeral **10**, a standard egg case or crate in which it is used is designated **11**, and the cartons which are supported and protected by the separator are designated **12** or **12'** depending on whether they are of the non-divisible or divisible type, respectively. These cartons are constructed in general accordance with the

teaching of the patent to Troyk Re. 18,922 of August 22, 1933. They include a one-piece, folded longitudinal partition and side wall construction **13** which is of W-shaped outline and a pluraility of bendable cross partitions **14**. The latter are disposed at a right angle to and interlocked with the partition and wall structure **13**, to define egg receiving cells, twelve in number, which are arranged in two parallel rows of six each. A hinged cover **15** closes the cartoned eggs.

As illustrated in Fig. 3, the contemplated use of the separator **10** involves the building up of carton and separator units in vertically extending tiers or layers; each unit includes a separator and three cartons arranged thereon in side-by-side order. The cartons in the respective successive tiers are preferably arranged at a 90° angle to one another, with the separator of each unit resting upon the carton covers of the subjacent unit, or, in the case of the lowermost layer, on the floor of case **11**.

Separator **10** comprises a unitary, specially shaped sheet which is molded (by an entirely conventional procedure from a watery slurry of paper pulp) in a roughly tray-like outline. It has a thickness of approximately 1/16" and may be finished in whatever degree of smoothness is desirable or practical, to the extent that the inherent yieldability or cushioning tendency of its texture which so well adapts molded pulp to my purpose is not substantially diminished.

The separator has a flat horizontal floor **16** terminating at its opposed side margins in upturned side restraining flanges or ribs **17**. These flanges, though otherwise unbraced, are substantially stiffened by the molding of the angle **18** at which they join floor **16**, another characteristic of pulp structures. Yet they are fairly readily flexible in the inward direction, so that they will yield and frictionally engage the case walls as the loaded separator unit is thrust downwardly into one of the compartments, designated **19**, of case **11**. The compartment is constituted by the opposed side walls and end wall of the case and the vertical partition **20**.

Separator **10** is shaped, inwardly of the opposed side flanges **17**, to provide alternate rows of individually elongated and upwardly tapered carton engaging and bracing elements, abutments or cleats **21**, **22** respectively. These are of inverted V-shaped or triangular outline in transverse cross section, the cleats **21** being substantially larger in this plane than the cleats **22**, as illustrated clearly in Fig. 5, and each merges integrally with alternate zones of the separator floor **16** which space the same from one another in the transverse direction.

There are two of the larger sized cleats **21** in each row thereof, being arranged in longitudinally spaced, end-to-end alignment. There are three of the smaller sized elongated cleats **22** in each alternating row, also arranged in longitudinally spaced end-to-end relation. The number of the respective triangular elements may be varied if desired; however a spacing of the larger cleats **21** medially of the length of the separator should be provided in order to accommodate the divisible type carton **12'**, as indicated in Fig. 2.

Referring to Fig. 1, the ends of cleats **21**, **22** are spaced from the opposite ends **23** of the separator floor **16**, and these end margins may be provided with a slight upward curl for the purpose of frictionally engaging the case walls as the separator unit is thrust in the case. This prevents longitudinal shift of the separator in the case and also provides a small retaining lip for spilled egg meat. The ends of the respective cleats are truncated at **24**, merging with floor **16**, and the adjacent ends of the cleats of each row are separated from one another at **25**. As stated, in the case of the larger cleats this is for the accommodation of cartons **12'** of the divisible type (see Fig. 2) characterized by two cross partitions **14'** which are closely adjacent one another on opposite sides of the longitudinal midpoint of the carton. The divisible style carton has a continuous transverse line of perforations **26** around its center to facilitate manual subdivision and after the carton is broken in two the halves thereof are closed, at their fresh ends, by the partitions **14'**. The floor space between successive rows of cleats **21** and **22** receives and supports the feet of the cross partitions, as well as the lower margins of the carton side walls, enabling the carton to rest stably on the separator floor, regardless of the type of carton.

The smaller sized cleats **22** are truncated at their adjacent ends, as at **28**, to provide a connecting drain passage **29**. In general, the cleating of the separator floor **16** has the effect of substantially rigidifying the separator, without reducing its cushioning action. Individually, the cleats are relatively inflexible and substantially more rigid than the sheet in which they are formed, considered as a whole. The slopes of the individual flange and cleat surfaces must be at least 22° to a normal to the separator's plane in order to enable the latter to strip properly from the molding and drying dies on which it is made, as well as to enable reasonably easy and quick separation from a nested relationship in which the separators are stored or shipped.

The intended manner of use of the separator should now be clear. Carton-separator units, each consisting of three of the cartons **12** or **12'** disposed in transverse side-by-side alignment across one of the separators **10**, with the cleft of each W-shaped carton bottom straddling a row of the larger sized cleats **21**, as illustrated in Fig. 3, are successively deposited in the case. Due to the frictional engagement of the upturned separator side flanges **17** with the case walls and/or partition **20**, appreciable, though not extraordinary, downward force is required to thrust the units into place, so that the separator thereafter resists lateral movement. At the same time, the slight curl **23** at the separator end margins is rolled further upwardly in sliding down the case wall, so as to grip the ends of cartons **12**, **12'** and thus afford a positive restraint of the cartons at their end zones. Although the case packing has been illustrated in a staggered or alternate horizontal arrangement of the tiers of separator units, the separator **10** is equally well adapted in an arrangement in which the layers have the same endwise orientation in the horizontal sense.

The upturned marginal flanges **17** and ends **23** of the separator effectively contain liquid from any eggs which are accidentally broken, preventing the same from running down to a lower layer and damaging or defacing the cartons therein. The separator also has a minimum of shaped surfaces which are nested with one another when a quantity of the articles are stacked, to the end that the stack will not unduly resist unnesting. Yet the cleat provisions are essential to the stiffening of the separator and to the proper lateral bracing or anchoring of the cartons against damaging impact. In short, the cleating of the separator floor and the flanging of its sides afford all the desired and necessary carton protection without sacrifice of any degree of practicality. It is a characteristic of the paper pulp molding procedure that the presence of angularly related surfaces on a formation molded of this material has the effect of rigidifying the formation at the junction of the surfaces. The invention utilizes this fact to afford a separator which gives desired side and end protection to separated articles, coupled with desired surface yieldability at any given localized article contacting area, so as to protect the article adequately there, also.

The separators offer a flat, stable surface on which the cartons rest, there being no tendency to cause tilting or canting of any carton, with resulting imposition of an excessive load on that particular carton. Due to its relatively thin, molded pulp construction, a minimum of vertical space is occupied by the separator, leaving ample volume within the case for the packing of thirty filled 2 x 6 cartons.

I claim:

1. A packing tray for use in packing filled egg cartons in a standard size egg case, which packing tray is in the form of a one piece substantially square tray member of molded paper pulp having a plain bottom face and a series of integral cleat formations upstanding in parallel relation from the top face thereof, said cleat formations being of generally triangular cross section and being transversely spaced to project between the side walls of a row of egg cartons positioned on the top face of said tray, said cleat formations terminating short of two opposite side edges of said tray, said two side edges of said tray being curved upwardly and upstanding flanges adjacent the other two side edges of said tray which flanges taper upwardly and outwardly to provide an abutment face for engaging the bottom outer edges of the outermost cartons in said row and for cooperation with the upwardly curved side edges to prevent any leakage of egg meats over the edges of the tray.

2. A separator for the case packing of cartoned eggs comprising a rectangular tray member of molded paper pulp having upstanding from one surface thereof successive transversely separated cleats for engaging within downwardly opening recesses in the bottom of a row of egg cartons which are positioned in side by side arrangement on said cleat bearing surface, said cleats being individually relatively inflexible as compared to the flexibility of the sheet as a whole, each of said cleats being tapered at the sides and ends thereof and terminating short of the end edges of said tray member, and said tray member having upwardly directed marginal formations around the peripheral edges thereof.

3. A one piece molded pulp tray for use in the packing of filled egg cartons within a standard size egg case which tray is characterized by having a planar bottom face and a series of spaced parallel cleat formations upstanding from the opposite face thereof, said cleat formations being of inverted generally V-shaped cross section and being spaced from each other a distance equal to the width of the egg cartons which are adapted to be positioned on the tray and upstanding intermediate cleat formations of smaller width arranged in parallel relation with said first mentioned cleat formations for engagement between said egg cartons, said first mentioned cleat formations each being divided into two sections on opposite sides of the transverse center line of said tray.

4. A separator device for use in packing filled egg cartons in superimposed relation in a standard size egg case, the egg cartons being characterized by a bottom having a longitudinally extending central recess of inverted V-shaped cross section and downwardly tapered side walls whereby when the cartons are supported in upright side by side relation parallel downwardly opening recesses of inverted V-shaped cross section are formed between the bottoms of adjacent cartons which recesses are of less width at the base than said central bottom recesses, said separator device comprising a one piece generally rectangular molded paper pulp member which is provided along oppositely disposed side edges with upstanding flanges presenting outwardly and upwardly tapered inwardly facing abutment surfaces for engagement with the lower portions of the tapered side walls of cartons positioned thereon, upstanding cleats of generally triangular cross section arranged in transversely spaced relation across said separator member, said cleats extending in parallel relation with the side flanges and presenting upwardly facing tapered surfaces for engagement within the central bottom recesses in cartons placed in side by side relation thereon, said separator member having between each of said cleats and the next adjacent cleat an upstanding cleat of generally triangular cross section which is of lesser width than the first mentioned cleats and which is adapted to extend between the bottom edges of adjacent cartons.

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