Nov. 3, 1970 W. F. PRENA 3,537,229

PRODUCT SPACING STRUCTURE

Filed Nov. 29, 1967 2 Sheets-Sheet 1

FIG. 1

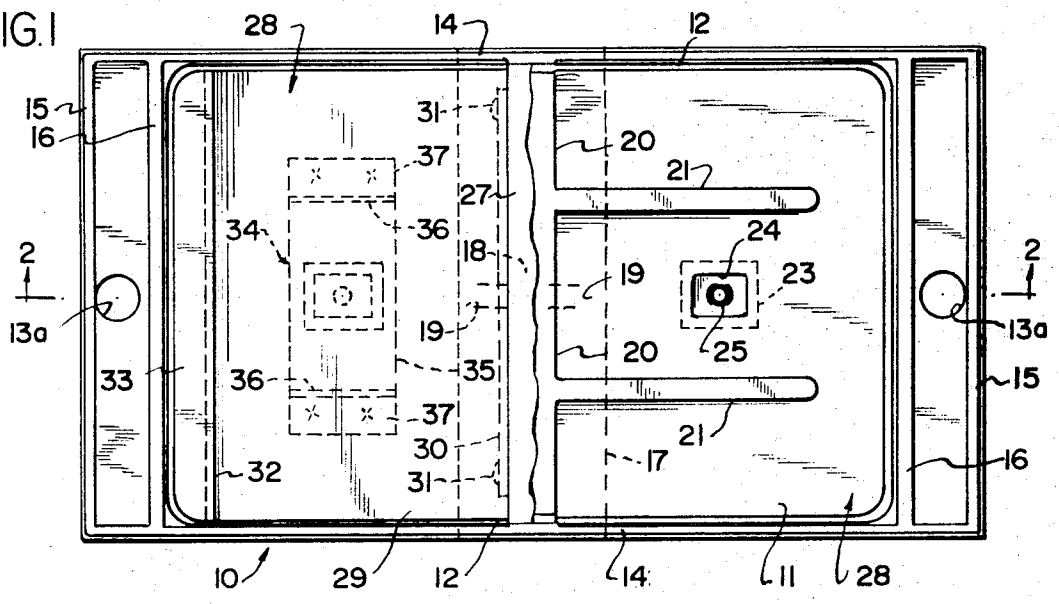
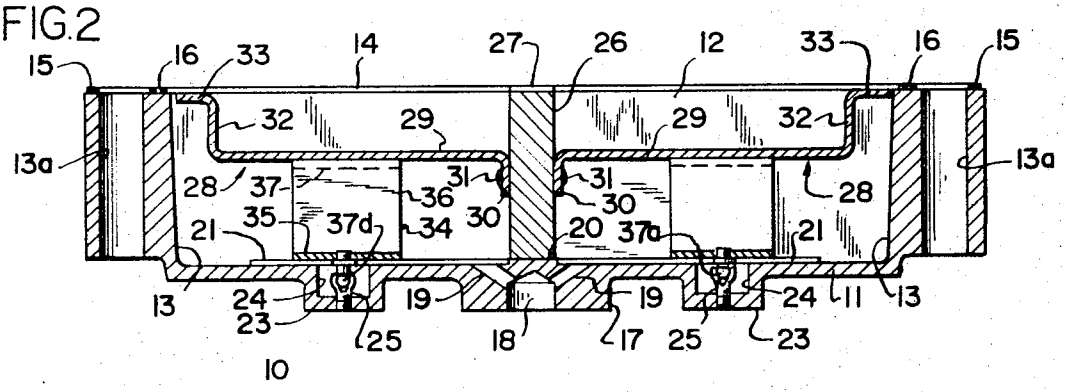


FIG. 2



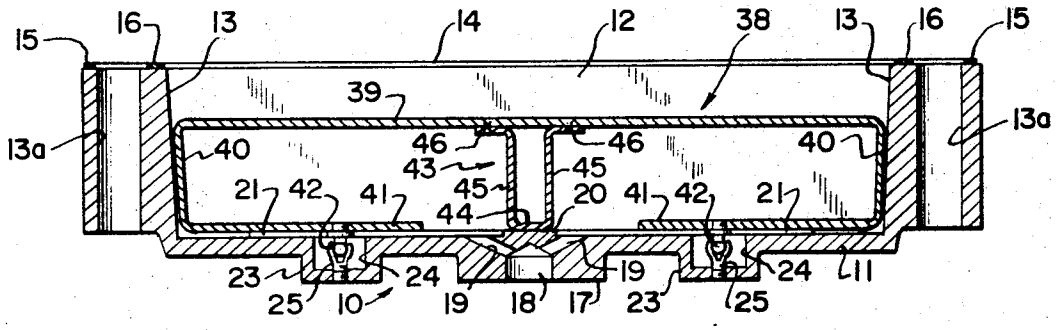


FIG. 3

INVENTOR.
WILLIAM F. PRENA
BY Hofgren, Wegner, Allen, Stellman & McCord.
ATTORNEYS.

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PRODUCT SPACING STRUCTURE

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FIG.4

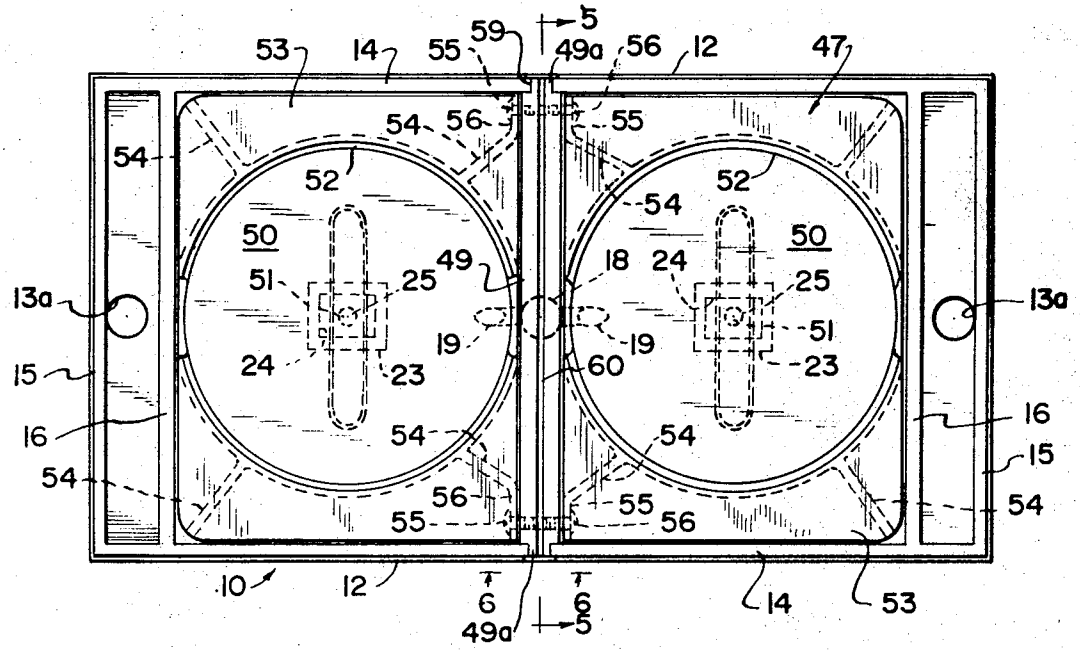


FIG.5

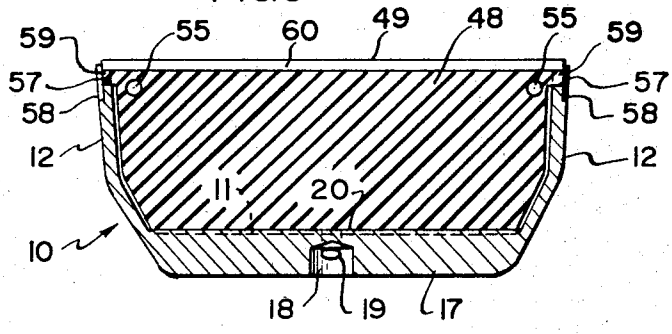


FIG.6

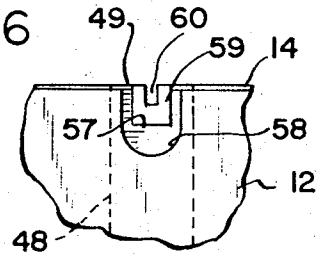


FIG.7

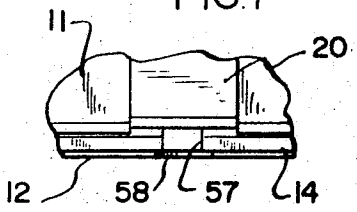
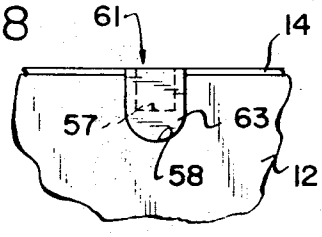


FIG.8



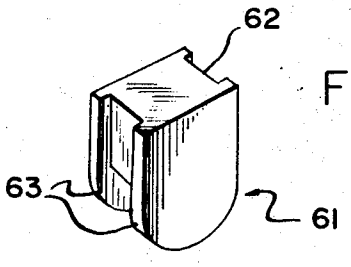


FIG.9

United States Patent Office

3,537,229
Patented Nov. 3, 1970

3,537,229

PRODUCT SPACING STRUCTURE

William F. Prena, Norridge, Ill., assignor, by mesne assignments, to John Morrell & Co., Chicago, Ill., a corporation of Delaware

Filed Nov. 29, 1967, Ser. No. 686,436
Int. Cl. B65b *31/00*
U.S. Cl. 53—112 5 Claims

ABSTRACT OF THE DISCLOSURE

A pocket structure for a vacuum packaging machine wherein a product spacing, compartment dividing means is removably mounted in the pocket, with product holding means being formed integrally with the product spacing means. An elongate notch is provided in the product spacing means, so that packages that are joined in a double line operation can be severed while in the pocket structure.

BACKGROUND OF THE INVENTION

The present invention relates to the vacuum packaging art; and more particularly to a vacuum packaging machine wherein a plurality of molding pockets are moved by a conveyor to a film drawing station where a lower layer of heated film is drawn into the pocket structure, then to a product loading station where a product is placed in the pocket structure upon the lower layer of film, and then to a sealing station where an upper layer of film is sealed to the lower layer of film, while the interior of the package is evacuated. In a single line vacuum packaging operation, wherein a single package is molded in each pocket, the packets have in the past usually merely included a bottom wall, with continuous wall means extending around the sides and ends of the bottom wall. In a double line vacuum packaging operation, wherein two packages are molded in each pocket, it has been conventional in the past to provide the pocket structure with an integral, non-removable divider wall. It will be appreciated that with such an arrangement, if it is desired to convert from a single line vacuum packaging operation to a double vacuum packaging operation, or vice versa, it is necessary to remove and replace all of the pocket structures, and this has obviously required a lengthy shutdown of the machine. In the recent past, it has been proposed to obviate the time consuming conversion process by making the divider wall within the pocket structure removable, so that a single set of pockets can be used for both single line and double line operations. While this simple expedient has been successful in certain respects, it has also been unsuccessful in certain other respects, as for example when it is necessary or desirable to place a molding insert in one of the compartments of the pocket structure, as is necessary for certain shaped products. A further drawback of present day removable double line dividers is that, heretofore, it has not been possible to sever the joined packages made in a single pocket directly upon the vacuum packaging machine, and it has been necessary to transport the two joined packages to a further apparatus where the severing is effected.

SUMMARY

The present invention provides a novel arrangement wherein the molding pockets are not only usable in both single line and double line packaging operations by virtue of the inclusion of a removable product spacing divider wall means, but the divider wall means also has product insert members formed integrally therewith to define a unitary assembly. The product insert portion of the product spacing assembly is shaped to correspond with the particular product being packaged, and thus the versatility of the vacuum packaging machine can be materially increased by merely having a plurality of sets of product spacing members having a variety of differently shaped inserts formed integrally therewith. The product spacing assembly of the present invention is readily removable from the pocket structure, and is releasably retained within the pocket structure by means of cooperating elements on the bottom wall of the pocket structure and the product insert portions of the product spacing assembly. The pocket structure of the present invention further includes a novel arrangement allowing a pair of adjacent packages formed in a double line operation to be slit directly upon the conveyor of the vacuum packaging machine itself, thus obviating the necessity of transporting the joined packages to a further severing station.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of a first embodiment of the invention, with a portion of the product spacing wall and product holding insert being broken away for clarity of illustration;

FIG. 2 is a cross sectional view taken generally along line **2—2** of FIG. 1;

FIG. 3 is a cross sectional view similar to FIG. 2, and illustrating a modified form of product holding insert assembly;

FIG. 4 is a top plan view similar to FIG. 1, and illustrating a modified pocket structure with a further embodiment of the product spacing assembly and holding means therein;

FIG. 5 is a cross sectional view taken generally along line **5—5** of FIG. 4;

FIG. 6 is a fragmentary, enlarged side elevational view illustrating the novel structural arrangement allowing joined packages to be severed directly upon a vacuum packaging machine;

FIG. 7 is a fragmentary plan view of the structure illustrated in FIG. 6, except that the product spacing assembly has been removed;

FIG. 8 is a fragmentary side elevational view similar to FIG. 6, and illustrating the use of an insert member during a single line operation; and

FIG. 9 is an enlarged perspective view of the insert member.

DESCRIPTION OF THE PREFERRED EMBODIMENT

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail an embodiment of the invention together with modifications thereof with the understanding that the present disclosure is to be considered as an exemplification of the principles of the inembodiments illustrated. The scope of the invention will be pointed out in the appended claims.

The pocket structure is indicated generally at **10** in FIGS. 1–5, and is an upwardly open cup-like member including a generally rectangularly shaped bottom wall **11**; a continuous wall means formed by parallel side walls **12** extending generally perpendicular with respect to bottom wall **11**, and spaced parallel end walls **13** extending generally perpendicularly with respect to bottom wall **11**. A vertical opening **13***a* is provided in each end wall **13** for reception of a vertically movable film edge clamping member, not shown, which can take the form of those illustrated in Myers application, Ser. No. 516,559, filed Dec. 27, 1965, now Pat. No. 3,397,507, and assigned to the assignee of the present application. Compressible means is provided on the upper surface of the pocket wall means, and said means includes narrow elongate rubber strips **14** on the upper surface of side walls **12**, and spaced, parallel narrow elongate rubber strips **15** and **16** on the upper strips **14–16** cooperates with further compressible

means on the product spacing insert members to be hereafter described to allow a seal around the compartments formed within the interior of the pocket structure to be created, when engaged with a sealing head, such as that shown in the above mentioned Myers application.

A downwardly extending centrally located projection **17** extends transversely across the pocket structure **10** on the lower surface of bottom wall **11**, with a central openning **18** being provided in projection **17**. Outwardly inclined passages **19** communicate with opening **18** and with chambers in the pocket structure on opposite sides of a divider wall to be hereafter described. Projection **17** is adapted to be engaged by a means for applying a vacuum to the pocket structure, so that a layer of film may be drawn into the pocket structure to form the lower portion of a package. A rib **20** is provided on the upper surface of bottom wall **11** midway between end walls **13**, and extends transversely across the pocket structure between the side walls **12**. A pair of spaced parallel ribs **21** extend laterally outwardly from the central rib **20**, and are adapted to support the product spacing inserts, as will hereinafter appear. As will be apparent to those skilled in the art, ribs **21** assist in spreading the vacuum applied to the pocket structure through opening **18**, so that the lower layer of film will be drawn into the pocket structure with a uniform force.

The bottom wall **11** of the pocket structure includes means for releasably retaining the product spacing and holding means therein, and to this end, bosses **23** extend downwardly from the lower surface of the bottom wall **11**, on opposite sides of projection **17**, with bores **24** in the bosses opening to the interior of the pocket structure. Spring clip members **25** are mounted in threaded openings in bores **24** and extend approximately to the level of the upper surface of the bottom wall **11**. Spring clip members **25** cooperate with means to be hereafter described on the product insert portions of the product spacing structure to releasably retain the same within the pocket structure **10**.

A first form of product spacing and product holding means is illustrated in FIGS. 1 and 2, and includes an upright wall **26** that extends perpendicularly between the side walls **12** of the pocket structure. As can be seen in FIG. 2, the lower end of wall **26** rests upon transverse rib **20** and divides the chamber within the pocket structure into two compartments of equal size. Compressible means, in the form of a rubber strip **27**, is provided upon the upper surface of wall **26**, so that when the sealing head referred to above is brought into engagement with the upper end of the pocket structure **10**, a vacuum can be applied to the two compartments on opposite sides of wall **26**. Product holding means **28** is formed integrally with wall **26**, and in the embodiment of FIGS. 1 and 2, one such means extends outwardly from each side of wall **26**. Each product holding means is in the form of a tray-shaped plate having a flat horizontal portion **29**, a downwardly bent flange **30** secured to wall **26** by screws **31** or the like, an upwardly extending portion **32**, and a horizontal portion **33** extending outwardly from the upper end of portion **32** toward pocket wall **13**.

A U-shaped bracket **34** is secured to the undersurface of each horizontal portion **29**, as by spot welding or the like, and brackets **34** each include a horizontally disposed portion **35** that rests upon ribs **21**, upright portions **36** extending upwardly from opposite ends of horizontal portion **33**, and horizontal portions **37** that extend outwardly from upright portions **36** and which are secured to the horizontal portions **29** of the product holding means. A detent ball **37***a* is carried by the horizontal portion **35** of each bracket **34**, and is releasably engageable with the spring clip **25** to positively, yet removably, mount the product spacing and holding means within the pocket structure **10**.

From the above, it will be apparent that when the product holding means **28** is removed from the pocket structure **10**, the pocket structure is suitable for use in a single line operation. When the product holding means **28** is positioned in the pocket structure **10**, the pocket structure is capable of use in a double line operation. In both the single line and double line operations, a lower layer of film is applied over the pocket structure, and the outer edges of the film are clamped against the upper surface of the end walls **13** of the pocket structure by clamp members movable in openings **13***a*. The lower layer of film is heated, and vacuum applied to the pocket structure through opening **18** draws the lower layer of film downwardly into the pocket structure. In a double line operation, each product holding means **28** forms a mold that is shaped suitably to conform to the particular product being packaged, it being understood that the lower layer of film being applied to the pocket structure will assume the general shape of the particular product holding means **28**. While the illustrated product holding means **28** forms a generally rectangularly shaped mold, it will be obvious that other configurations may be used, as desired.

During certain single line operations, it is also desirable to use product insert means, and an illustrative form is indicated generally at **38** in FIG. 3. Product holding means **38** includes a horizontally disposed upper portion **39** that extends between end walls **13**, when the product holding means **38** is placed within the pocket structure **10**. Generally vertically disposed portions **40** extend downwardly from the outer ends of horizontal portion **39**, and horizontally disposed portions **41** extend inwardly toward one another from the lower end of each downwardly extending portion **40**. Detent balls **41** extend downwardly from the center of each horizontal portion **41** of the product holding insert **38**, and the balls **42** are engaged with the spring clips **25** to releasably mount the product holding insert **38** and the pocket structure **10**. A generally U-shaped brace **43** extends transversely of horizontal portion **39**, and brace **43** includes a horizontal portion **44** that rests upon the transverse rib **20** in the pocket structure **10**. Brace **43** further includes spaced uprights **45** extending upwardly from opposite sides of central portion **44**, and horizontal portions **46**, which extend laterally outwardly from the upper end of each upright portion **45**.

It will be well understood to those skilled in the art that after the product being packaged is placed within the product holding molds, upon the lower layer of film, in either a single line or double line operation, the product structure **10** then moves to a final sealing station where an upper layer of film is applied to the lower layer of film to complete the package or packages. At the final sealing station, a sealing head moves into engagement with the upper layer of film to press the same against the lower layer of film in the area of the rubber strip **14–16** so that a substantially sealed condition is created within the pocket structure. A suitable final sealing head is disclosed in the above mentioned Myers application, and such a head leaves a small unsealed portion adjacent each end wall **13** of the pocket structure, so that the interior of the formed packages can be evacuated. The sealing head also includes final sealing means for closing the small unsealed portion, after the desired degree of evacuation of the packages is achieved.

A further form of product holding means adapted for use in a double line operation is indicated generally at **47** in FIG. 4, and product holding means **47** includes a central vertically disposed divider wall **48**. A rubber strip **49** is provided on the upper surface of divider wall **48**, and extends from end to end thereof. As is clear from FIG. 4, the product holding means **47** is adapted to hold a circular product, and to this end, the product holding means includes circular horizontal portions **50** on opposite sides of divider wall **48**. A detent ball **51** extends downwardly from the lower surface of each portion **50**, and cooperates with a spring clip **25** to releasably retain the product holding means in the pocket **10**. A cylindrical wall **52** extends upwardly from the outer periphery of each horizontal por-

tion **50**, and a horizontal upper wall portion **53** extends outwardly from the upper end of each cylindrical wall **52**. Ribs **54** extend generally radially outwardly of cylindrical wall **52**, and downwardly from each horizontal wall **53**. The ribs **54** adjacent the divider wall **48** include foot portions **56** that are secured to the divider wall **48** by screws **55**.

While the pocket structure **10** illustrated in FIGS. 4–9 is substantially identical to that illustrated in FIGS. 1–3, it differs therefrom in that it includes means allowing the two packages formed in a double line operation to be severed directly upon the conveyor of the vacuum packaging machine. To this end, an upwardly facing rectangular notch **57** is provided in each side wall **12** of the pocket structure **10** in alignment with the divider wall **48**. A generally U-shaped recess **58** (FIG. 6) is provided in the outer surface of each side wall **12** adjacent notch **57**. Divider wall **48** includes rectangular extensions **59** of reduced width at each end, which are seated in the notches **57**, when the product holding means **47** is placed in the pocket structure **10**. As is evident from FIG. 4, the outer ends **49***a* of rubber strip **49** are also reduced in width so as to be substantially coextensive with the extensions **59**. An upwardly opening central slot **60** is provided in the upper end of wall **48**, and slot **60** extends from end to end of wall **48**, including extensions **59**. From the above, it will be apparent that a package severing means, such as a knife having a blade member with a thickness slightly less than the width of slot **60**, can be mounted at a suitable place on the vacuum packaging machine, such as on the sealing head, to sever the two joined packages as they move with the conveyor past the severing means.

When the pocket illustrated in FIG. 4 is utilized in a single line operation, inserts **61** (FIGS. 8 and 9) are inserted in notches **57**; and inserts **61** are formed of a compressible material, such as rubber, so that an effective seal can be created around the periphery of the packages during the final sealing operations. As can be best seen in FIG. 9, inserts **61** include a generally rectangular central portion **62** having a size substantially the same as notches **57**, so as to disposed the upper surface of the insert **61** in substantially the same plane as the rubber strips **14** upon the sides **12** of the pocket structure. Inserts **61** further include generally U-shaped flanges **63** at opposite sides of central portion **62**, and as is evident from FIG. 8, flanges **63** have a size which corresponds to the size of recesses **58**.

I claim:

1. A pocket structure for use in a vacuum packaging machine comprising: a bottom wall having an opening therein through which a vacuum can be applied; continuous wall means extending upwardly from said bottom wall including a pair of spaced parallel walls at opposite sides of said bottom wall and cooperating therewith to define

a chamber; product spacing means mounted in said chamber for dividing said chamber into plural separate product receiving compartments, said product spacing means including an upright central divider wall extending generally transversely of said side walls and plural product holding means attached thereto, with one such product holding means being positioned in each compartment; means for releasably retaining said product spacing means in said chambers; compressible means on the upper end of said wall means and said central wall, whereby the top of said chamber and/or said compartments can be sealed; and aligned notches in the upper end of each side wall, with said divider wall having an extension at each end thereof seated in one of said notches.

2. A pocket structure as set forth in claim **1** wherein an elongate groove is provided in the upper surface of said divider wall and extensions.

3. A pocket structure for use in a vacuum packaging machine comprising: a bottom wall; a pair of end walls extending upwardly from opposite ends of said bottom wall; a pair of side walls extending upwardly from opposite sides of said bottom wall, each side wall spanning the extent between said end walls and cooperating with said end walls to define a continuous wall means; means defining a notch in each of said side walls, said notches being in alignment with one another; compressible means on the upper end of said end walls and side walls; and a removable insert in each of said notches, said inserts being formed of a compressible material.

4. A pocket structure as set forth in claim **2** including a pair of removable inserts of compressible material positionable one in each of said notches to form a continuous pocket perimeter when said product spacing means with the central divider wall is not used.

5. A pocket structure as defined in claim **3** including a divider wall positionable between said side walls and having an extension at each end thereof positionable in said side wall notches upon removal of said inserts, and compressible material on the top of said divider wall which lies coplanar with the compressible means on said end and side walls.

References Cited

UNITED STATES PATENTS

1,708,304	4/1929	Elliott	249—131
3,343,332	9/1967	Mahaffy et al.	53—112 X
3,353,218	11/1967	Cloud et al.	53—184 X

TRAVIS S. McGEHEE, Primary Examiner

U.S. Cl. X.R.

18—35; 53—184