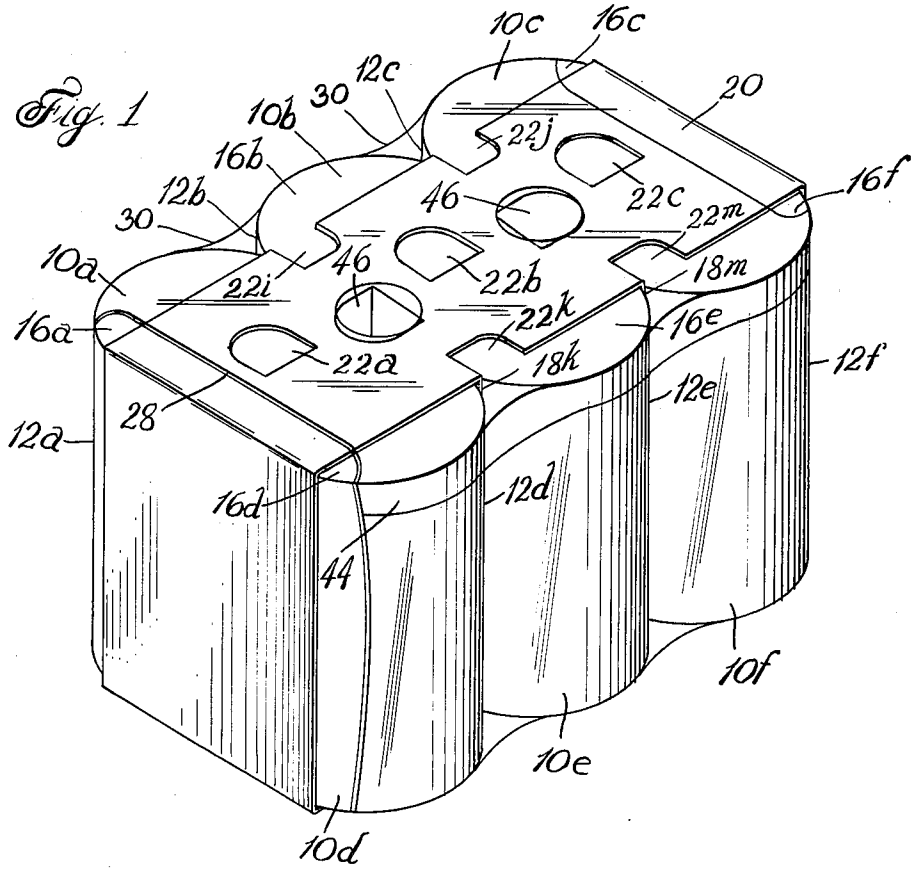
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MULTI-CONTAINER PACKAGING

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Fig. 1



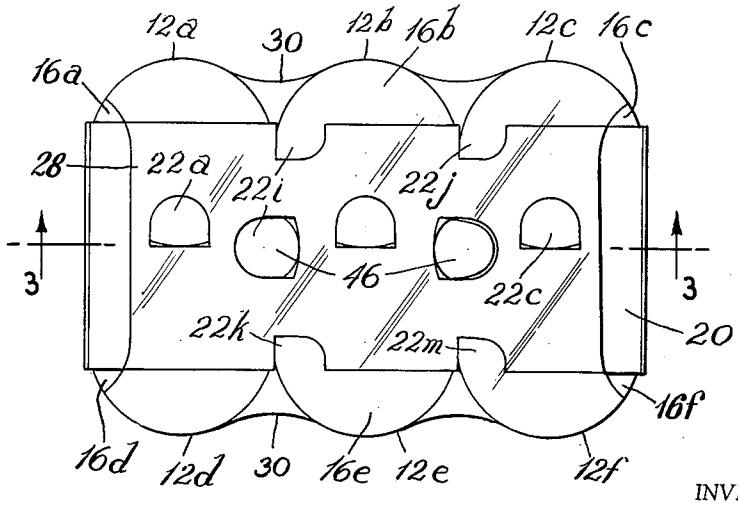


Fig. 2.

INVENTORS
NICHOLAS B. POTTER
PAUL C. SHEPARD

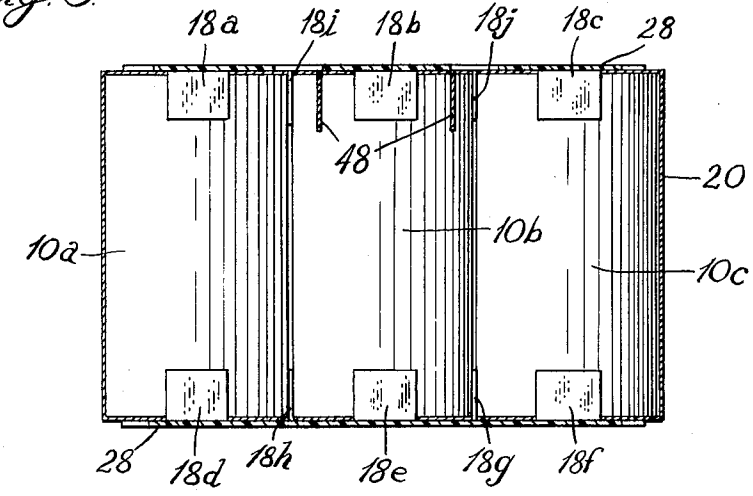
BY Louis J. Bachand Jr
ATTORNEY

Nov. 23, 1965 N. B. POTTER ETAL 3,219,183

MULTI-CONTAINER PACKAGING

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Fig. 3



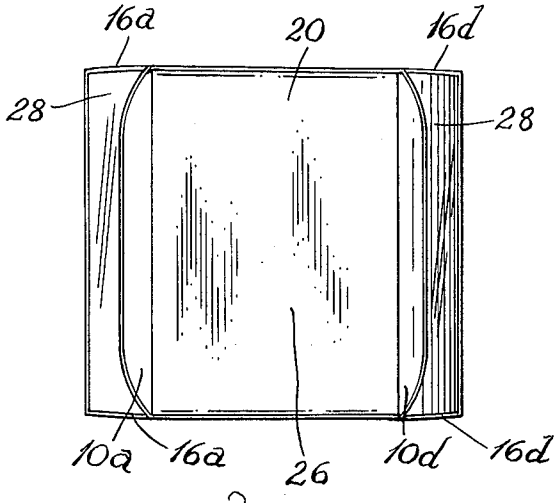


Fig. 4

INVENTORS
NICHOLAS B. POTTER
PAUL C. SHEPARD
BY Louis J. Bachand Jr
ATTORNEY

Nov. 23, 1965 N. B. POTTER ETAL 3,219,183

MULTI-CONTAINER PACKAGING

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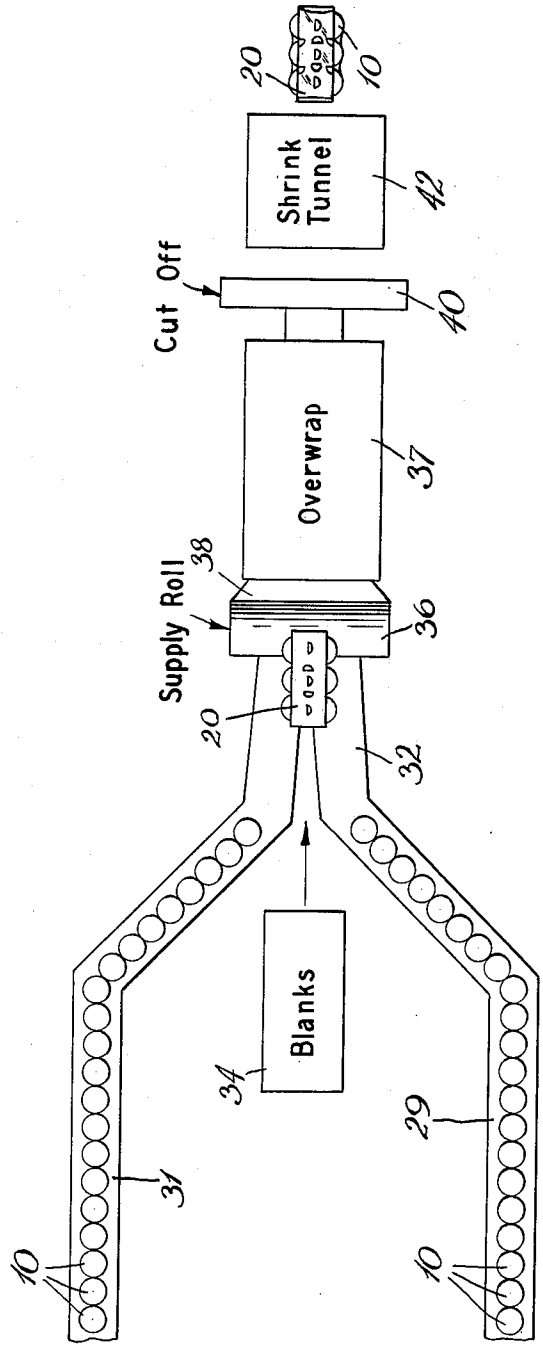


Fig. 5.

INVENTORS
NICHOLAS B. POTTER
PAUL C. SHEPARD

BY Louis J. Bachand Jr.
ATTORNEY.

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3,219,183

MULTI-CONTAINER PACKAGING

Nicholas B. Potter and Paul C. Shepard, New York, N.Y., assignors to Union Carbide Corporation, a corporation of New York, and St. Regis Paper Company, a corporation of New York

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5 Claims. (Cl. 206—65)

This invention relates to packaging. More particularly the invention relates to packaging two or more containers such as cans, bottles, spiral wound paperboard canisters, and the like. The invention relates in a particular aspect to an improved package for a plurality of containers wherein strength, durability, attractiveness and low unit cost are significant advantages over presently known multi-container packages. The invention further relates to method and apparatus for producing the multi-container package of the present invention.

Modern marketing techniques make extensive use of multi-container packages as a means of increasing sales, providing greater convenience to consumers, lowering shipping and handling costs and for special combination promotions. These packages have heretofore been fabricated of paperboard, appropriately scored and printed, which is fastened in some manner around the containers. It is essentially a duplicative cost to producers to print on the paper stock since the containers generally are printed as well. Opaque packaging, however, necessitates further printing. A further disadvantage of paperboard for multi-container packaging is the difficulty of providing product identification or advertising material at the ends of the package. The amount and cut of the paperboard necessary for end identification entails great additional expense. Failure to provide end covering can likely result in exposure of unsightly seam lines unless special, costly precautions are taken to properly orient end containers.

Multi-container packages using transparent packaging materials such as thermoplastic film are known such as sacks of frozen juice cans. The difficulty with this type of package is that the containers are not maintained in relative position and therefore crash together during shipment resulting in dented or even broken-open containers.

Paperboard container packaging avoids this problem by providing separators between adjacent containers. These separators absorb the shocks of would-be container collisions and preserve the integrity of the containers during shipment.

It is an object, therefore, of the present invention to provide multi-container packaging offering see-throughability, waterproofness, toughness, container protection and attractiveness, at low cost.

It is another object to provide a multi-container package wherein individual containers are supported, separated one from another and visible through the package.

It is another object to provide end identification in multi-container packaging.

It is another object to provide method for producing multi-container packaging.

It is still another object to provide apparatus for producing multi-container packaging.

The multi-container packaging of the present invention comprises a plurality of individual containers in juxtaposed arrangement, separators positioned between adjacent containers, means for supporting the separators and means for maintaining the containers in said juxtaposition comprising closely fitting heat shrunk thermoplastic film.

There is also provided method and apparatus for achieving multi-container packaging. The method comprises arranging a plurality of containers in juxtaposed relation,

positioning and maintaining separators between adjacent containers, fastening, as by sealing heat shrinkable thermoplastic film around the juxtaposed containers, and shrinking and closely fitting said film against the juxtaposed containers by applying heat to said film.

The apparatus comprises means for positioning containers in juxtaposed relation, means for positioning a separator between adjacent containers, means for placing heat shrinkable thermoplastic film around the juxtaposed containers, means for fastening the thermoplastic film therearound and means for applying heat to the film after fastening.

In the drawings:

FIGURE 1 is an isometric view of a package for six containers;

FIGURE 2 is a plan view of the package shown in FIGURE 1;

FIGURE 3 is a sectional view in elevation taken along line 3—3 of FIGURE 2;

FIGURE 4 is an end view in elevation of the packaging shown in FIGURE 1; and

FIGURE 5 is a plan view of one embodiment of apparatus for carrying out the packaging method of the present invention.

Referring now to the drawings in detail there is shown a plurality of six containers **10***a*, **10***b*, **10***c*, **10***d*, **10***e* and **10***f* such as beer cans, having walls **12***a*, **12***b*, **12***c*, **12***d*, **12***e* and **12***f* and ends **16***a*, **16***b*, **16***c*, **16***d*, **16***e* and **16***f* arranged in juxtaposed relation into three right and left hand pairs **10***a* and **10***d*, **10***b* and **10***e*, and **10***c* and **10***f*, and two trios **10***a*, **10***b* and **10***c* and **10***d*, **10***e* and **10***f*. As few as two and as many containers as desired can be similarly packaged.

As best shown in FIGURE 3 between adjacent members of these pairs are positioned separators which in the embodiment shown are flaps **18***a* and **18***d* between containers **10***a* and **10***d*, flaps **18***b* and **18***e* between containers **10***b* and **10***e* and flaps **18***c* and **18***f* between containers **10***c* and **10***f*. In addition, separators are positioned between adjacent containers in each trio of containers, namely for trio **10***a*, **10***b* and **10***c* in FIGURE 3, flaps **18***h* and **18***i* are between containers **10***a* and **10***b* and flaps **18***g* and **18***j* are between containers **10***b* and **10***c*. Not shown are flaps corresponding to **18***h–j* which are provided between container **10***d*, **10***e* and **10***f*.

The separators can be made of any material capable of holding apart adjacent containers. Thus paperboard, plastic, including foamed plastic, rubber, wood, metal or other material can be used. The thickness of the separators is not critical it being required merely that the adjacent containers be held apart. Containers such as beverage cans which have chimes or peripherally protruding edges at their top and bottom will require a tougher and/or thicker separator because of the great forces developed in the relatively narrow area of closest proximity of adjacent containers. Generally all separators will be made of the same material and in the same thickness but this is not a requirement. No particular geometry is necessary for the separators which are to be used in the present package, and square, rectangular, round, hemispherical, regular or odd-shaped separators are all satisfactory. The length and width of separators should be such as enables separation to be maintained between adjacent containers.

Means are provided for supporting the separators such as band **20**. Other means of supporting the separators such as clips fastened to adjacent containers, adhesives, glues and cements of bonding the separators to the containers or other substrate or a protrusion from the separators themselves providing mechanical support for the separators and the like can also be used.

In the preferred embodiment of the package shown in the drawings the flaps **18***a–j* extend from and are supjorted by the band **20** which circumscribes the arranged containers endwise. The band **20** can be fabricated of virtually any material including those named above for the separators but is preferably plastic or paperboard. The width of the band **20** is at least that necessary to provide support for the separators at their spacing in the particular package. It is preferred the band **20** be long enough to extend all around the arranged containers and be fastened. Space for end identification is provided at **26**.

In the embodiment shown in the drawings, the band **20** is cut at appropriate places generally indicated at **22***a*, **22***b*, **22***c*, **22***i*, **22***j*, **22***k* and **22***m* to provide the flaps **18***a*, **18***b*, **18***c*, **18***i*, **18***k*, and **18***m* respectively.

The containers **10** are maintained in their arranged juxtaposition by a heat shrunk thermoplastic film **28**. It will be noted the film **28** is individually contoured around the ends **16** of the containers **10**. This is clearly shown by the indentations **30** in the film **28** between adjacent containers. Support for the containers thus is provided by the film **28** and, therefore, the band **20** need only be strong enough to hold the separators in position. This results in a saving because thinner paperboard can be used for band **20** and this is less expensive.

A further advantage of these packages is that they do not lose their strength when immersed in water, as can happen to conventional paperboard packages left in a beer cooler or in a mountain stream.

Thermoplastic film which can be used in the present invention comprises one or more synthetic organic thermoplastic polymers. Generally useful polymers are polymers of monoolefins, i.e. compounds having the formula $R—CH=CH_2$, wherein R is hydrogen, or an aromatic or aliphatic hydrocarbon group such as an aryl or alkyl group, particularly an alkyl group having from 1 to 8 carbon atoms, such as polyethylene, polypropylene, polystyrene, ethylene/propylene copolymers and like polymers; and copolymers of such olefins with one or more other compounds copolymerizable therewith which contain polymer producing unsaturation such as is present for example in carbon monoxide and in organic compounds containing olefin in unsaturation >C=C< e.g. vinyl chloride, butene vinyl acetate, methyl methacrylate, monobutyl maleate, 2-ethyl hexyl acrylate, N-methyl-N-vinyl acetamide, methacrylic acid, ethyl acrylate, acrylic acid, isoprene, acrylamide, vinyl triethoxylsilane, bicycloheptene, divinyl phosphonate and the like, as well as other types of polymers including polycarbonates and condensation products of equimolar amounts of dihydric phenols and mono and/or diepoxide, the thermoplastic polyhydroxyethers.

The term "heat shrinkable" as used herein refers to the property of a film whereby is contracts in length and/or width upon exposure to sufficient heat. Shrinking is generally attributable to a reorientation of molecules which were previously oriented by stretching the film either uniaxially longitudinally (machine direction) or horizontally (transverse direction) or biaxially (both directions). The amount of shrinkability in the film is not critical, the only requirement being that the film fit closely to the containers after shrinking.

The term "heat shrunk" describes the condition of a heat shrinkable material after application thereto of heat sufficient to cause shrinkage.

A tear strip such as that shown at **44** is advantageously provided to enable ready removal of the thermoplastic film.

The method and apparatus of the invention will now be described in conjunction with FIGURE 5.

As shown therein, a plurality of containers **10** are carried along a predetermined path which can be a pair of moving belts here generally indicated at **29** and **31** or other transport means to an arranging zone such as indexer **32** where the containers **10** are arranged in the desired juxtaposed relation. In the drawing this relation is three rows of containers two abreast. Simultaneously, a blank **34** from which band **20** is formed is brought to the arranging zone and folded around the arranged containers and fastened. The banded, arranged containers are moved along a path away from the arranging station to a wrapping station **37** where heat shrinkable thermoplastic film **38** from supply roll **36** is placed around the banded, arranged containers. The film wrap **38** can be parallel to the longitudinal axis of the arranged containers or other arrangements can be used provided the ends of the outermost containers are within the volume delimited by the heat shrinkable film **38**. It is preferred to provide a finger grip such as two holes indicated by the numeral **46** in the drawings, by perforating the film at the interstices between containers, preferably with a hot punch. Preferably band **20** is cut correspondingly at these places, leaving projections **48** extending into the interstices for finger comfort in carrying the package. In the embodiment shown, film is continuously folded around successive banded arranged containers. A severing zone, therefore, is provided at **40** where successive wrapped containers are severed one from another with a cutting knife, hot bar or other severing means. The heat shrinkable film wrapped containers are then passed through a heating zone such as shrink tunnel **42** where heat sufficient to shrink film **38** is applied to the film. The arranged containers banded endwise by band **20** and held sidewise by heat shrunk film **38** are then passed to a distribution area.

We claim:

1. Multi-container package comprising a plurality of individual containers in juxtaposed arrangement, an appropriately cut band circumscribing the arranged containers endwise, separators carried by the band and extending therefrom, said separators positioned between adjacent containers and a closely fitting heat shrunk thermoplastic film enclosing the assembled containers and band maintaining said containers in said juxtaposed arrangement.

2. The package claimed in claim **1** wherein the band is fabricated of paperboard.

3. The package claimed in claim **1** wherein the thermoplastic film is polypropylene.

4. The package claimed in claim **1** wherein said film circumscribes the arranged containers endwise.

5. The package claimed in claim **4** having a plurality of cans arranged in two rows of threes.

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THERON E. CONDON, *Primary Examiner.*