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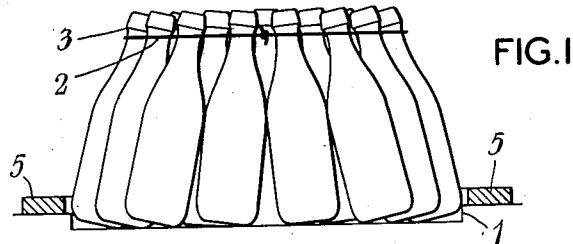
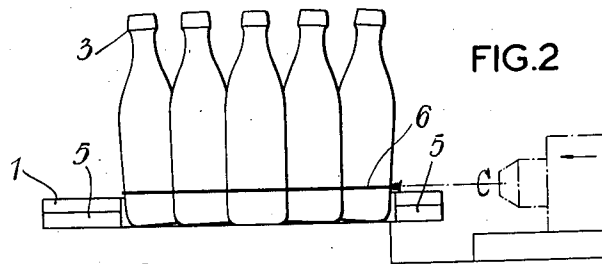
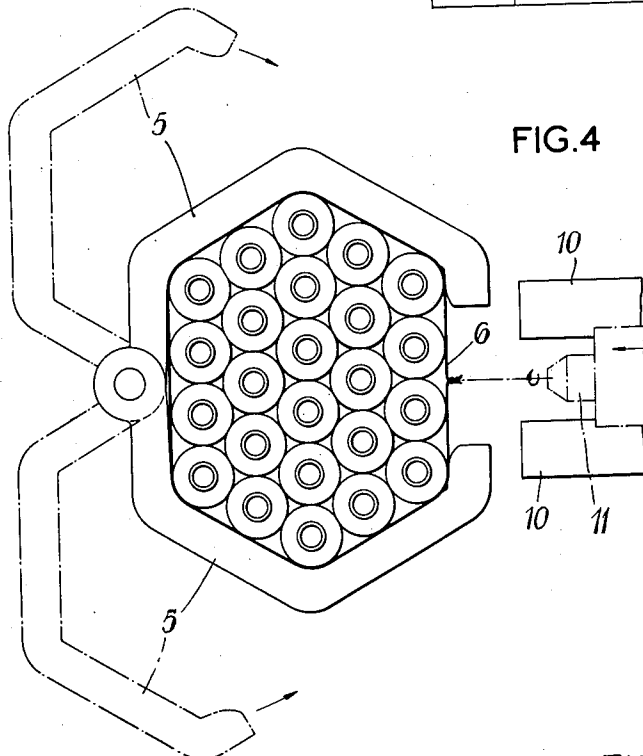
T. R. MARTIN ET AL

3,073,086

METHOD AND MACHINE FOR PACKAGING BOTTLES

Filed Nov. 30, 1960

2 Sheets-Sheet 1



INVENTORS

THOMAS R. MARTIN
HENRY F. WHATLEY

Smiley & Smiley
ATTYS.

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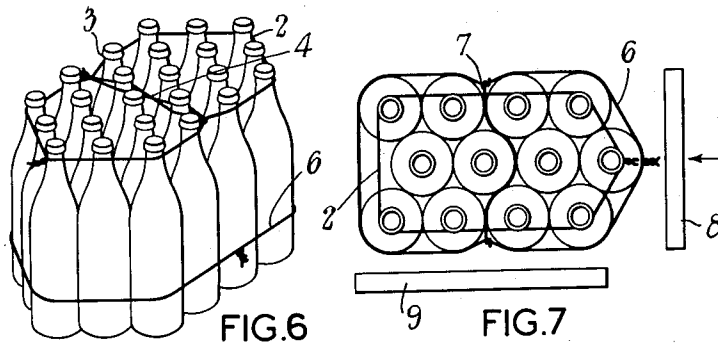
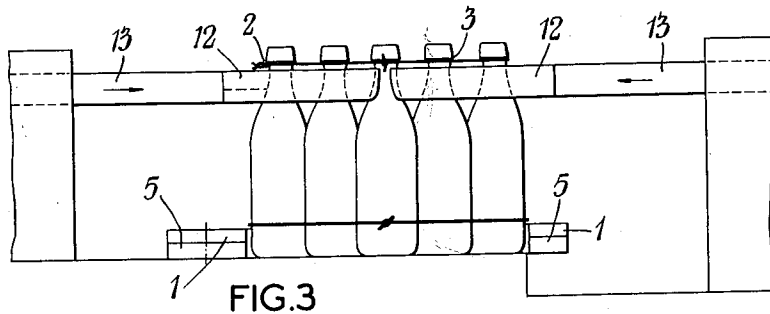
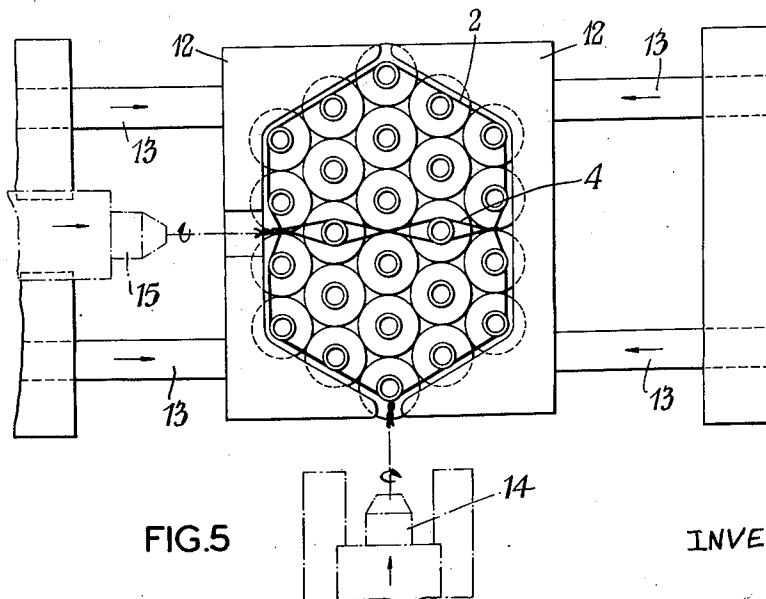
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METHOD AND MACHINE FOR PACKAGING BOTTLES

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INVENTORS

THOMAS R. MARTIN
HENRY F. WHATLEY

Smiley & Smiley
Attys.

1

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METHOD AND MACHINE FOR PACKAGING BOTTLES

Thomas Ronald Martin, Twickenham, and Henry Frederick Whatley, Hounslow, England, assignors to Gerard Industries Limited, Brentford, England

Filed Nov. 30, 1960, Ser. No. 72,626

7 Claims. (Cl. 53—3)

This invention concerns an improved method and machine for packaging bottles and is applicable to the type of bottle which has a rounded or curved shoulder at the junction of body and neck, such as the common form of beer or wine bottle.

The handling of bottles in bulk is a laborious and costly business; the normal packer or stacker handles only two bottles at a time. Furthermore the stacking of bottles involves the use of large quantities of soft interlayering material, such as old newspaper.

It is the object of the invention to provide a method and machine for packaging bottles in easily handled compact blocks of, say, one or two dozen according to size and weight.

A simple wire tie or metal band loop adds very little to the bulk or weight of a package and attention was directed to the employment of wire or metal band ties to achieve the object of the invention.

According to the invention from one aspect, we provide a method of packaging bottles of the type referred to which comprises arranging the bottles the same way up in staggered rows and compact configuration, applying a first loop of high tensile metal closely around the arrangement of bottles adjacent to the tops or bottoms of the bottles while the opposite ends of the bottles are permitted a degree of free movement relative to one another, applying mutually compacting pressure to the said opposite ends of the bottles to tension the said first loop due to the rocking movement of the bottles relative to one another where their shoulders contact, applying a second loop of high tensile metal closely about the said compacted opposite ends and releasing the compacting pressure.

In one preferred method of packaging in accordance with the invention a cross tie is fixed between inwardly sprung opposite sides of the second loop before release of the compacting pressure to maintain that loop in greater tension.

The cross tie and the loop may be formed from a single piece of wire.

In another preferred method of packaging according to the invention a cross tie is fixed between inwardly sprung opposite sides of the first loop before compacting pressure is applied to the opposite ends of the bottles and a second cross tie is applied to inwardly sprung opposite sides of the second loop before compacting pressure is released.

From another aspect the invention provides a machine for packaging bottles of the kind referred to comprising a frame for jiggling bottle bases in a desired pattern, the said frame including at least one side member movable inwardly by which a compacting pressure is applied to those bases after a band has been applied about the periphery of the pattern of bottles at their necks.

The machine may include automatic wire or band tensioning and fastening means.

The above and other features of the invention are embodied in the preferred methods of making up packs of bottles and apparatus for carrying out such methods which will now be described (purely by way of example) in the following description with reference to the accompanying drawings in which:

FIG. 1 is a diagrammatic side view of a form of pack-

2

aging apparatus including bottles squeezed together at their necks.

FIG. 2 is a diagrammatic side view of a form of packaging apparatus including bottles squeezed together at their bases.

FIG. 3 is a diagrammatic side view of the packaging apparatus of FIG. 2 including bottles with two wires in position.

FIG. 4 is a diagrammatic plan view of lower clamping means included in the apparatus of FIG. 2.

FIG. 5 is a diagrammatic plan view of upper clamping means included in the apparatus of FIG. 2.

FIG. 6 is a perspective view of a finished pack of twenty-four bottles.

FIG. 7 is a diagrammatic plan view of a finished pack of a dozen bottles.

Referring first to FIGS. 1 and 6 a pack of twenty-four half-pint size beer bottles of the crown cork type are placed in a jig frame 1 of irregular hexagonal shape.

A row of six bottles contacting one another is arranged upright along the longest diagonal of the frame and is flanked on both sides by a row of five upright bottles which nest into the interstices between the bottles of the row of six.

Two further rows of four upright bottles are placed to flank the rows of five bottles.

A loop 2 of high tensile wire is now placed so as to embrace the necks of the fourteen bottles which form the outside layer of the pattern of bottles, this may be an endless loop placed, e.g. manually, or a loop formed by a suitable machine.

The loop of wire 2 as finally placed is of such length that the necks of the bottles are drawn in slightly towards the centre of the pattern when it is in position.

The best vertical position for placing this first loop is just below the normal swelling 3 which is located below the crown cork sealing rim.

A cross tie or ties 4 of wire is, or are, put across the two opposite longer sides of the loop 2 at about its centre to lie athwart the pattern of bottles and the opposite longer side of the loop 2 at about its centre. The cross tie may be formed from an extended end of the tie 2.

These centres of the loop 2 are next pressed in towards one another to form shallow V shaped indentations and the cross tie is fastened to the centres of the indentations.

At this stage the bottles of the pattern have their bases somewhat splayed outwards due to the mutual pivoting of the bottles at the level of their rounded shoulders as a result of the light tension of the loop (as shown somewhat exaggeratedly in FIG. 1).

Now clamping arms 5 of a clamping means are pressed inwardly against the sides of the bottles in the rows which they contact. Such pressing may be performed manually through a lever system or the like or may be brought about mechanically, electrically or hydraulically.

The result of the inward pressure at the base of the pattern of bottles is to reduce or eliminate the splaying of those bases and at the same time to put the loop 2 about the necks into a high degree of tension.

While the pressure of the clamping means against the bottle bases is still being applied a second loop 6 of high tensile wire is applied over the periphery of the pattern of bottles to embrace the outermost layer about one or two inches from the base.

The pressure of the clamping arms 5 is now released and the tensions in the first and second loops 2, 6 tend to equalise due to the above-mentioned mutual pivoting of the bottles of the pattern.

The finished pack, FIG. 6, is found in practice to be completely firm with every bottle so tightly jammed against its neighbours that it is impossible to remove

3

a bottle or deform the outline of the pack without cutting the ties.

In making up a pack of twelve one pint size crown cork bottles a similar method is employed, but in this case the bottles are arranged in a jig frame in three contiguous staggered rows of four bottles each (generally as in FIG. 7).

A straight length of wire 7 is placed athwart the pattern of bottles between the longer sides of the pattern dividing the bottles into two groups of six. The wire lies upon the upper surface of the shallow side members of the frame 1.

The first loop 2 and cross tie 4 (omitted from FIG. 7 for clarity of illustration) are now placed in position about the necks of the nine bottles in the outer layer of the pattern so formed in a similar manner to that described above.

An end wall or gate 8 of the jig frame 1 is now closed to bring the bases of the bottles more closely together in the direction of the longest side of the pattern. Closing of this end wall or gate 8 may lightly tension the first loop 2 but its main function is to form the length of wire 7 into appropriate corrugations between the bottles.

At least one further wall 9 of the frame 1 is now pressed inwards and a high degree of tension is set up in the first loop 2.

A second loop 6 is now pushed over the periphery of the pattern of bottles to within a short distance of the base in contact with the now corrugated cross wire 7.

The sides of this second loop 6 are now pressed inwardly in the neighbourhood of the free ends of the cross wire 7. Such pressing may be performed by a separate tool manually, or by fitments fixed to the jig frame sides which may be operated manually, mechanically, electrically or hydraulically.

The free ends of the cross wire 7 are deformed into hooks to grasp the inwardly pressed parts of the second loop and maintain it tightly about the periphery of the bottle pattern. Such deformation may take place simultaneously with the conclusion of the inward pressing or may be performed thereafter.

On release of inward pressure by the frame 1 against the bottle bases, tensions in the two loops 2, 6 tend to equalise and the finished pack may be removed for storage or transport.

A more or less automatically operating machine is illustrated in FIGS. 2 to 5 of the drawings, wherein references similar to those used in connection with FIGS. 1 and 6 are employed.

Referring first to FIGS. 2 and 4 a pack of twenty-four bottles is arranged in hexagonal formation within the former 1. The bases of the bottles are pressed inwardly by clamping arms 5 operated upon by rams 10 and a lower loop 6 of wire or band is tensioned and tied near the bases of the bottles by a twisting head 11.

The bottles are now splayed outwardly as shown in FIG. 2.

Upper clamps 12, FIG. 3, are now pressed inwardly against the necks of the bottles by rams 13 to cause the bottles to assume an upright or even a slightly inwardly splayed attitude.

An upper loop 2 of wire or band is next tensioned and tied around the necks of the bottles by a twisting head 14, and finally a straining cross wire 4 is tensioned and tied between the opposite sides of the loop 2 by means of a twisting head 15.

4

The clamping arms are withdrawn and a firm bottle pack as shown in FIG. 6 can be removed from the former.

It will be apparent that what may be termed a "stable" pattern of bottle arrangement must be employed. For example, if six bottles are to be packed, it would be absurd to arrange them in one straight line when two staggered rows of three will produce a more compact and less easily disrupted outline.

In general patterns should be chosen in which each bottle contacts at least two other bottles and where this is not possible the interstitial spaces between bottles should be kept to a minimum.

We claim:

1. A method of packaging bottles of the type having rounded shoulders which comprises arranging the bottles the same way up in staggered rows and compact configuration, applying a first loop of high tensile metal closely around the arrangement of bottles adjacent to one end of the bottles while the opposite ends of the bottles are permitted a degree of free movement relative to one another, applying mutual compacting pressure to the said opposite ends of the bottles to tension the said first loop due to rocking movement of the bottles relative to one another where their shoulders contact, applying a second loop of high tensile metal about the said compacted opposite ends and releasing the compacting pressure.

2. A method of packaging as claimed in claim 1 in which at least one of the loops is tensioned and tied mechanically.

3. A method of packaging as in claim 1 in which a cross tie is fixed between opposite sides of the second loop before the release of the compacting pressure to maintain the loops in greater tension.

4. A method of packaging as in claim 1 in which cross ties are fixed between opposite sides of both loops.

5. A method of packaging as in claim 3 in which the tie is formed from the same single piece of metal as the loop.

6. In a machine for packaging bottles having rounded shoulders, a former to cause the bottles to adopt a compact pattern while positioned in the same direction with their axes parallel, clamping means to compact the ends of the bottles first at one side of said shoulders and then at the opposite side of said shoulders in directions perpendicular to the axes of the bottles thereby rocking the bottles about their shoulders, and means to successively place and tie separately tensioned members at each end of the bottles while that respective end is being compacted, the rocking movement of the bottles about said shoulders during compacting increasing the tension of said members in the completed tied pack of bottles.

7. In a machine for packing bottles the combination set forth in claim 6 wherein said means to place and tie members at the ends of the bottles operates automatically to tie loops of metal about the compact patterns.

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