Aug. 2, 1966 P. H. GRAHN ETAL 3,263,843
APPARATUS FOR REMOVING A PARALLELEPIPEDIC WRAPPING FROM BOTTLE, CANS AND THE LIKE, ENCLOSED IN SUCH A WRAPPING
Filed May 28, 1964 3 Sheets-Sheet 1

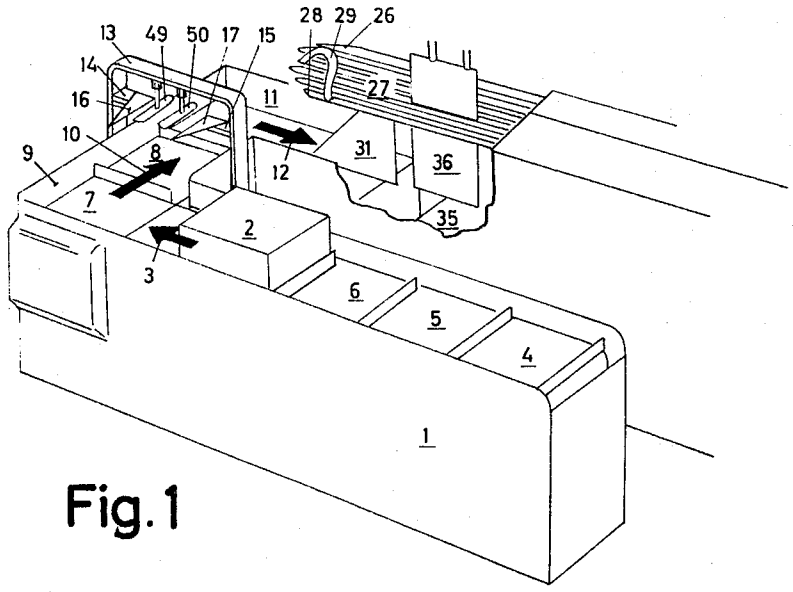


Fig. 1

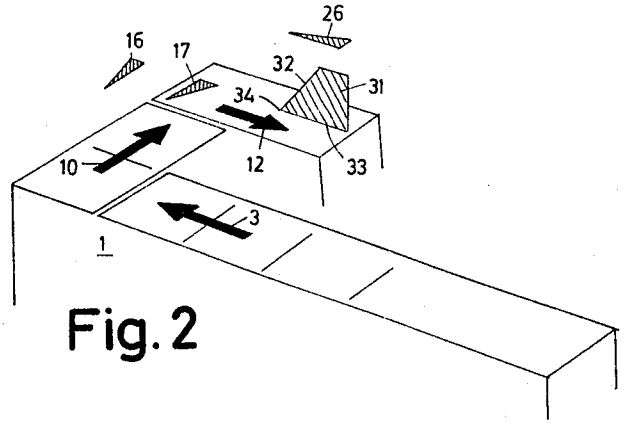


Fig. 2

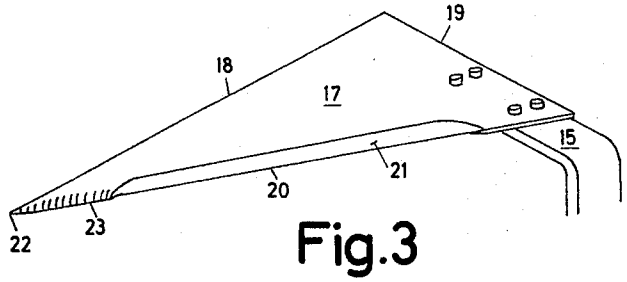


Fig. 3

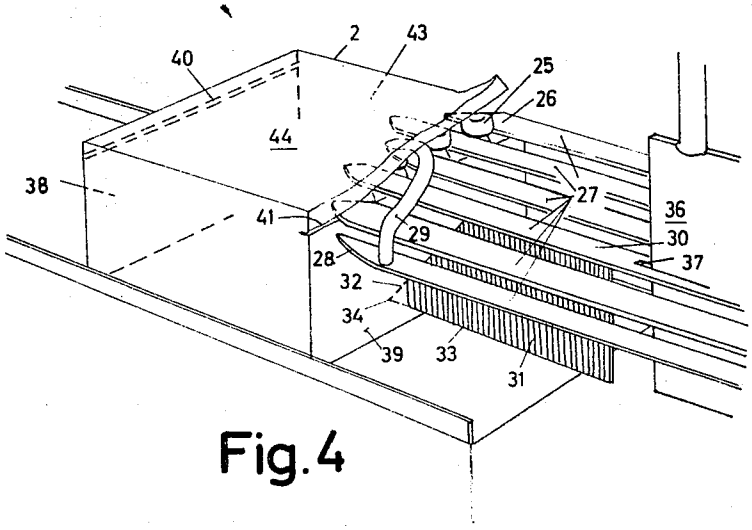

2
43
40
25
26
44
38
27
36
41
29
30
28
37
32
34
39
33
31

Fig.4

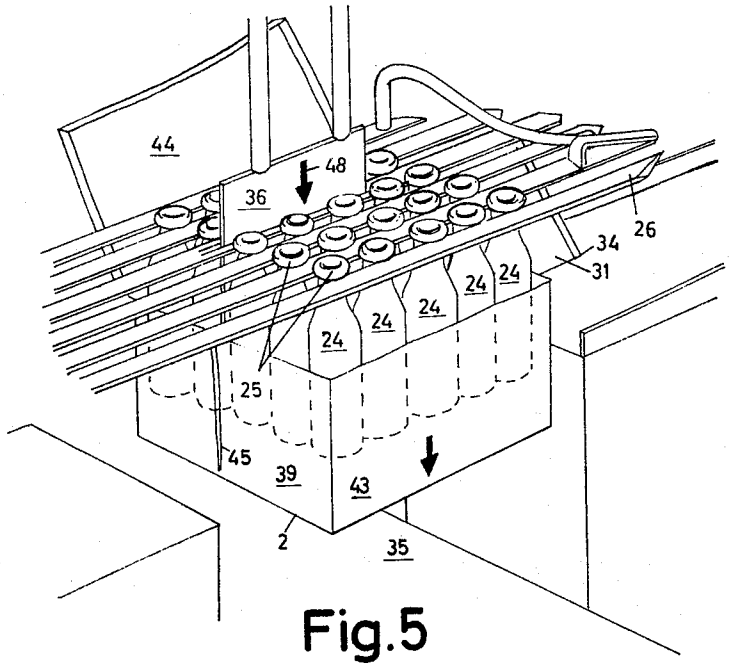

44
48
36
26
34
31
24
24
24
24
24
25
45
39
43
2
35

Fig.5

Aug. 2, 1966 P. H. GRAHN ETAL 3,263,843
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Filed May 28, 1964 3 Sheets-Sheet 3

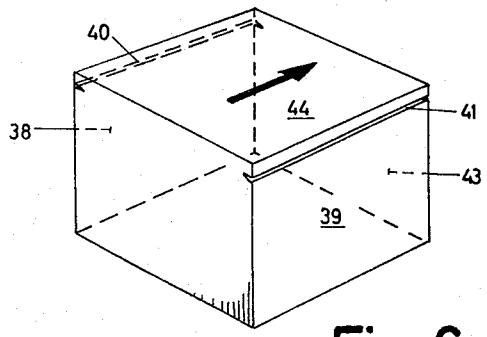


Fig. 6

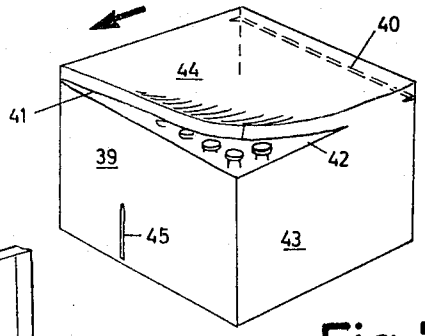


Fig. 7

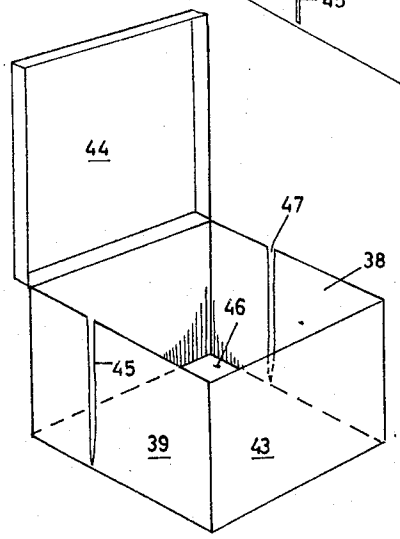


Fig. 8

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3,263,843

APPARATUS FOR REMOVING A PARALLELEPIPEDIC WRAPPING FROM BOTTLES, CANS AND THE LIKE, ENCLOSED IN SUCH A WRAPPING

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4 Claims. (Cl. 214—305)

Empty bottles are usually sent to the consumer in boxes or cartons. Consequently, the boxes or cartons must first be sent to the manufacturer of the bottles, and subsequently to the consumer of the bottles. This is an expensive method, as the boxes or cartons are expensive and involves the cost for transporting the empty boxes from the manufacturer of the boxes to the manufacturer of the bottles. For reducing said costs the bottles, placed in rows side by side, can be wrapped up to form a parallelepipedic parcel. Said parallelepipedic parcel can be a bag having a parallelepipedic shape, one wall being closed after the bag has been filled with the desired number of bottles. The material of the wrapping can be paper, corrugated pasteboard, cardboard, light-metal foil, plastic, cloth or other suitable material. Therefore, the wrapping material to be transported to the manufacturer of the bottles is inexpensive and requires little space.

When bottles wrapped up in this way arrive at consumer the wrapping is usually torn up manually, and the bottles are removed from the wrapping. This is a time-consuming and inconvenient way.

The object of the invention is to provide a remedy for said inconveniences, and relates to a method for removing the wrapping from the bottles in a simple way.

The invention may be applied not only to bottles but also to cans, tins, and other containers, provided that they have a thickened circumferential portion on which they can be suspended by the supporting member which will be described below.

According to the invention the removal of the wrapping from the bottles take place by placing the wrapping to give the bottles an upright position, providing a longitudinal cut in two opposite walls of the wrapping, said cuts preferably extending along the whole length of the walls and being situated at the same height from the bottom of the wrapping, preferably on a level below a thickened circumferential portion of the neck of the bottles or of the side wall of the cans, cutting a third cut in the third wall of the wrapping at the same height as said first cuts, bending up the top portion of the wrapping above said cuts so as to expose the thickened circumferential portions, bringing the bottles and the wrapping, thus opened, to engage a supporting member for the bottles so as to suspend the bottles in said supporting member by said thickened circumferential portions, and removing the wrapping from the bottles.

The invention also relates to an apparatus for bringing the invention into practical use. This apparatus consists of two conveyors, situated perpendicularly to each other. A parcel of bottles is fed along one conveyor to the second conveyor and along said second conveyor. During the transport along the first conveyor the parcel passes two knives situated on each side of the conveyor to produce two longitudinal cuts along the walls of the wrapping which are parallel with the direction of movement of the parcel. During the passage along the second conveyor a cutting member cuts one side of the wrapping which is parallel with the direction of movement of this conveyor. After having been cut the parcel is brought into contact

with a supporting member so that the bottles hang down from said supporing member. Simultaneously, or a little earlier, the top of the wrapping is bent up. When all bottles are hanging in the supporting member the wrapping is removed, either by a member that pushes the bottom of the wrapping downward or by a suction member that engages the bottom of the wrapping from the outside. Alternatively, the wrapping can be blown away by pressurized air.

In an advantageous embodiment of the invention there are one or more vertical cutting members, each producing a cut extending from the bottom of the wrapping up to cuts extending parallel with the bottom. Such a cut facilitates the insertion of the member which has to push away the wrapping from the bottles, and enables the wrapping to be easily removed from the bottles.

The invention will be more closely described with reference to the accompanying three drawings. FIG. 1 shows, diagrammatically, a complete apparatus. FIG. 2 illustrates how said apparatus works. FIG. 3 shows an embodiment of a cutting member of the apparatus. FIGS. 4 and 5 illustrate the operation of the supporting member and the means for removing the wrapping. FIGS. 6, 7 and 8 illustrate various steps of cutting up a wrapping.

The apparatus of FIG. 1 comprises a first conveyor **1** upon which a parcel **2** of bottles is being fed in the direction of arrow **3**, a second conveyor **9** which is perpendicular to conveyor **1** and upon which the parcel will be fed as indicated by arrow **10**, and a third conveyor **11** which is perpendicular to conveyor **9** and upon which the parcel will be fed as indicated by arrow **12**. The conveyors can consist of endless belts. Preferably, the belts shall be synchronized so as to produce a continuous feeding. Alternatively, the conveyors can consist of stationary, smooth surfaces upon which the parcels are slidable by means of pushing members, not shown. The side walls of the parcel are situated in the same direction during the entire operation, i.e. the parcel does not rotate when being fed from one conveyor to the next one.

At conveyor **9** there is a member **13** supporting two arms **14** and **15**, extending inwardly from support **13**. Two knives **16** and **17** are fastened to said arms. The knives are clearly illustrated in FIG. 3, which shows the right-hand knife **17**. The knife consists of a metal plate which has two sides **18** and **19** which make a right angle. The hypotenuse of said triangle has a sharp edge **21**. Said edge does not extend along the entire length of the hypotenuse, but there is a portion **23** which extends from the point **22** and which has no sharp edge. The cutting member **17** is so mounted in the support **13** that its plane surface is parallel with the bottom of conveyor **9** and its side **18** is parallel with the direction of movement of conveyor **9**. The knives **16** and **17** are mounted on such a height relative to parcel **2** that the thickened circumferential portion **25** of the bottles **24** is situated higher than knife **17**. The distance between the parallel edges **18** of the two knives **16** and **17** is somewhat smaller than the width of parcel **2**.

At conveyor **11** there is a knife **26** which is similar to knife **16** and which is mounted on one of the elongated support members **27**.

Above conveyor **11** there are a plurality of elongated, parallel members **27**, which are clearly illustrated in FIGS. 4 and 5. The members **27** are spaced from each other a distance which corresponds to the width of the neck of bottles **24**, and which is smaller than the outer diameter of the thickened circumferential portion **25** of the bottles. Consequently, a bottle which is inserted from the left between two elongated members of FIG. 1 will be hanging suspended on said elongated members. One of the elongated members, see reference character **28**, supports a rod or strip **29** which is shaped so as to bend up a portion

of the wrapping, which will be described below. A vertical knife **31** is fastened to one of the elongated members **27**, see reference character **30**. This knife, too, is shaped as a triangle and has a sharp edge **32**. A sharp edge is also provided on the portion of the side **33** which is adjacent the point **34**. Below the elongated members **27** there is an area **35** which has no conveyor. A rectangular plate **36** is movable vertically above said area, to act as a pushing member. The plate is movable in an opening **37** in the elongated member **30**, which is one of the elongated members **27**. The rectangular plate **36** may have teeth on its lower edge.

The apparatus now described operates in this way. For the sake of clearness FIG. 1 shows only one parcel **2** of bottles. The parcel **2** contains bottles **24** arranged in rows, as clearly disclosed in FIG. 5.

When the parcel **2** is being fed upon conveyor **9** in the direction of arrow **10** the front side of the parcel will engage the points **22** of knives **16** and **17**. The points **22** will penetrate into the parcel, and the edge **21** of knife **17** and the corresponding edge of knife **16** will engage the longitudinal sides **38, 39** of parcel **2** to produce longitudinal cuts **40** and **41** while parcel **2** moves up to conveyor **11**. During the transport of the parcel on conveyor **11** in the direction of arrow **12** knife **26** produces a longitudinal cut **42** in side wall **43**. Simultaneously, the elongated members **27** penetrate into parcel **2** to engage the bottles. The member **29** is shaped to bend up the top **44** of the wrapping. Simultaneously, knife **31** gets into operation and cuts a cut **45** in wall **39**, said cut extending from the bottom **46** of parcel **2** up to cut **41**. During the continued movement of the parcel there will also be produced a cut **47** in wall **38**, which is opposite to wall **39**, said cut extending from the bottom **46** of parcel **2** up to cut **40**. Cuts **45** and **47** are required for enabling plate **36** to be inserted into parcel **2**, as illustrated in FIG. 5, and for enabling the wrapping to be released from the bottles. When the parcel is in the position illustrated in FIG. 5 the wrapping can be removed from the bottles by a vertical movement of plate **36** in the direction of arrow **48**. As mentioned above, the bottom edge of the plate has teeth to prevent parcel **2** from sliding away from plate **36** during the downward movement of the plate in the opening **35** of the conveyor. The plate moves a distance required for entirely removing wrapping **2** from the bottles. Instead of plate **36** pressurized air can be used, acting in the direction of arrow **48**, or a suction device can be provided in opening **35** to remove wrapping **2** from bottles **24**.

Obviously knife **31** can be omitted if plate **36** is lifted so high as to allow an opened wrapping to pass below the lower edge of the plate.

The illustrated apparatus can be provided with two auxiliary members **49** and **50** which are fastened to the upper portion of holder **13**. The auxiliary members are elongated and parallel with the feeding direction of conveyor **9**. They are fastened to holder **13** in such a position that each auxiliary member is situated between two rows of bottles. Consequently, the two auxiliary members will press down the top portion of the wrapping between two rows of bottles. Therefore, the sides of the wrapping which are parallel with the feeding direction will be taut, thus facilitating the operation of the knives **16** and **17**.

The illustrated auxiliary members **50** can be replaced by rollers arranged to roll upon and press down the top of the wrapping.

Obviously, the parts of the apparatus can be varied very much within the scope of the invention. As described above, the essence of the invention resides in first cutting two cuts **40** and **41** in wrapping **2** and subsequently a third cut **42**, lifting up the top portion **44** and suspending the bottles in the elongated members **27**. This having been done, wrapping **2** can be removed from the bottles in any suitable way. A third cut can, within the scope of the invention, be provided in the top portion **44** so as to extend between the two cuts **40** and **41**. When the top is bent up there will be formed two lid portions instead of one as described above.

The parcel can contain two or more layers of bottles or cans, one layer situated upon another layer. This necessitates a number of supporting members which is equal to the number of layers. These supporting members must be situated above each other.

When the bottles have been freed from the wrapping as described above, they can be transferred by known methods to a conveyor to be further treated, for instance washed, filled and the like.

What is claimed is:

1. Apparatus for removing the wrappings from parcels of bottles comprising a first conveyor and a second conveyor positioned perpendicular to each other and having means for moving parcels along the first conveyor to the second conveyor and along the latter, two cutting members supported at the same level above said first conveyor to produce horizontal cuts in two opposite sides of the wrapping of each parcel when it passes said cutting members, a third cutting member supported above said second conveyor at the same level as said two cutting members to produce a horizontal cut in a third side of said wrapping when it passes said third cutting member, a bending-up member supported adjacent to said second conveyor to bend up the top of said wrapping released by said cuts, supporting means positioned above said second conveyor adapted to suspend the bottles of said parcels by their necks when the bottles are moved forward relative to said supporting means, and means positioned adjacent to said second conveyor for removing the wrappings from the bottles while the bottles are hanging from said supporting means, said means for removing the wrappings consisting essentially of at least one plane vertically disposed plate and means for moving said plate vertically to engage the bottoms of said wrappings and a vertical knife positioned in front of said plate to produce vertical cuts in the sides of said wrappings extending from the bottoms thereof to said horizontal cuts in opposite side thereof and in line with said plate.

2. Apparatus for removing the wrappings from parcels of bottles comprising a first conveyor and a second conveyor positioned perpendicular to each other and having means for moving parcels along the first conveyor to the second conveyor and along the latter, two cutting members supported at the same level above said first conveyor to produce horizontal cuts in two opposite sides of the wrapping of each parcel when it passes said cutting members, a third cutting member supported above said second conveyor at the same level as said two cutting members to produce a horizontal cut in a third side of said wrapping when it passes said third cutting member, a bending-up member supported adjacent to said second conveyor to bend up the top of said wrapping released by said cuts, supporting means positioned above said second conveyor adapted to suspend the bottles of said parcels by their necks when the bottles are moved forward relative to said supporting means, and means positioned adjacent to said second conveyor for removing the wrappings from the bottles while the bottles are hanging from said supporting means, said means for removing the wrappings consisting essentially of means for applying air pressure downwardly to the bottoms of said wrappings.

3. Apparatus as defined in claim **2** in which said two cutting members and said third cutting member are positioned to produce horizontal cuts in the wrappings of said parcels below the level of the thickened necks of the bottles in said parcels.

4. Apparatus as defined in claim **2** in which each cutting member is a triangular plate having a first non-cutting edge extending substantially parallel to the conveyor over which it is supported, and a second edge extending at an acute angle to said first non-cutting edge, said second

edge having a non-cutting portion adjacent to the intersection of said second edge with said first edge and a cutting portion extending rearwardly of said non-cutting portion.

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