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APPARATUS AND METHOD FOR PACKAGING GROUPS OF ARTICLES

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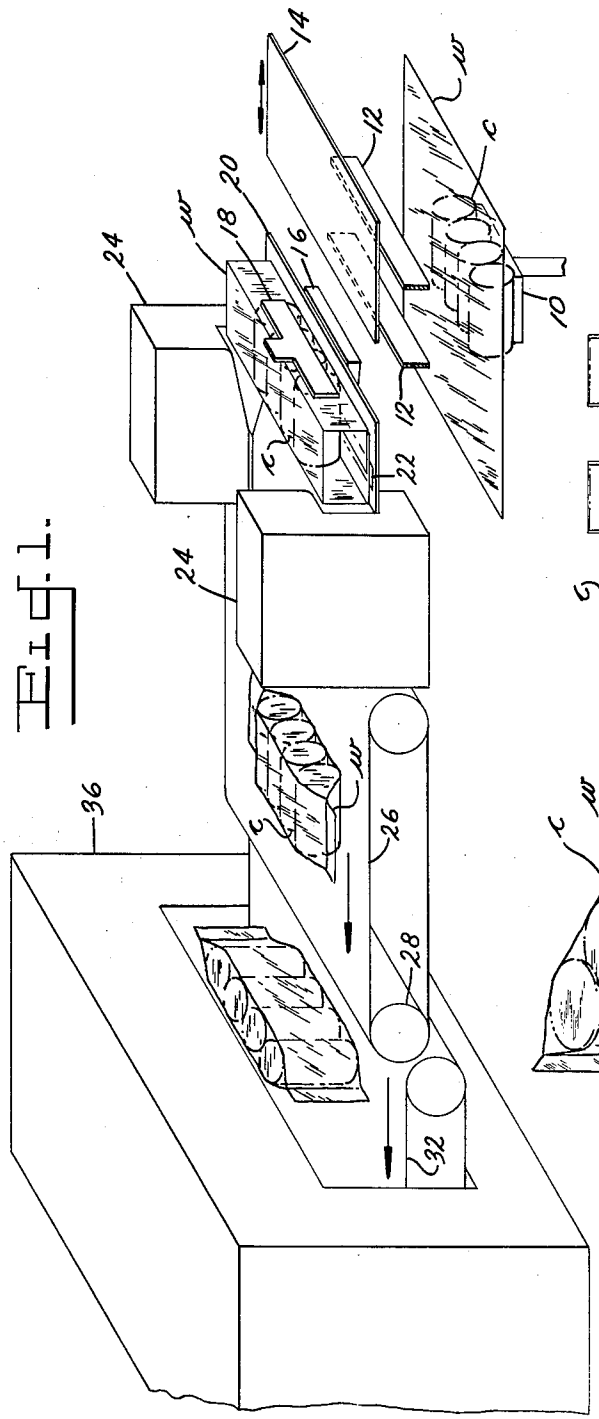

Fig. 1.

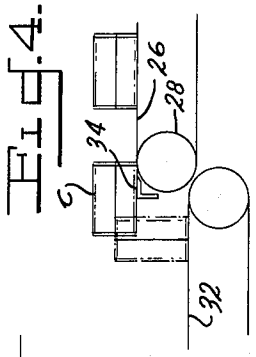

Fig. 4.

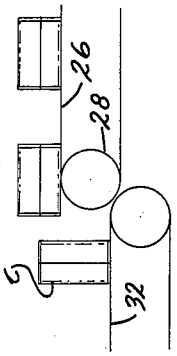

Fig. 3.

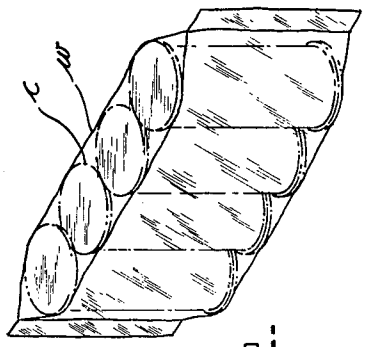

Fig. 2.

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APPARATUS AND METHOD FOR PACKAGING GROUPS OF ARTICLES

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4 Claims. (Cl. 53—30)

The present invention relates to improvements in packaging machines and more particularly to improvements in the packaging of a plurality of objects in film which shrinks when subjected to heat.

The object of the invention is to properly align objects, such as cans having beaded edges at their opposite ends, in a heat shrunk film package.

In accordance with the present inventive concepts, a group of objects, such as tin cans, are wrapped in a heat shrinkable film. Originally the cans are on their sides in side-by-side relation. After the enveloping wrapper film has been sealed, the cans are simultaneously tipped to an upright position. This aligns the cans within both a lateral and heightwise sense so that they may be passed through a heated atmosphere or equivalent to shrink the wrapper film. By so aligning the cans prior to shrinking the film, the desired alignment of the cans will be obtained in the finished package, that is, the all encompassing tension of the shrunk film locks the cans in the described aligned relation. The locking effect of the film is sufficient at least to maintain the aligned relation of the cans during normal handling in packing and eventually placing the packages on store shelves where they are available for retail purchase.

The above and other related objects and features of the invention will be apparent from a reading of the following description of the disclosure found in the accompanying drawing and the novelty thereof pointed out in the appended claims.

In the drawing:

FIG. 1 is a diagrammatic showing of a packaging machine embodying the present invention;

FIG. 2 is a perspective view of a partially formed package.

FIG. 3 is a detail elevation illustrating the aligning function; and

FIG. 4 is a detail elevation illustrating alternate means for carrying out the aligning function.

FIG. 1 shows a group of four cans *c* which have been fed onto an elevator 10. The elevator 10 is raised to drape a wrapper *w* about the cans *c* as they pass between folding plates 12. At the top of the elevator's stroke a back folder plate 14 is advanced to lay one end portion of the wrapper *w* beneath the cans *c*. The elevator 10 is lowered as the plate 14 is advanced, with the front edges of the cans being held by a latch plate 16. Thereafter the cans are advanced by flights 18 of an overhead conveyor onto a plate 20 to complete the encirclement of the cans in the wrapper *w*. A heated element 22 is embedded in the plate 20 to seal the lapped wrapper seam.

The machine elements, including means for feeding the cans onto the elevator 10, described up to this point, are well known in the industry except that it is a more common practice to additionally provide means for folding the tubular wrapper extensions against the end faces of the articles. Reference may be had to U.S. Patent No. 2,146,997 or other patents for a fuller understanding of the elements referred to, as well as the end folding elements which have been omitted.

After being entubed in the wrapper *w*, the cans are next advanced between a pair of sealing units 24. Each unit

24 is constructed essentially in accordance with the disclosure in U.S. Patent No. 2,727,648, with the exception that saddle labels are not folded over the sealed end seams. These units comprise a pair of opposed bands which collapse the tubular wrapper extensions and then pass them between heated elements to form heat sealed seams at opposite ends of the wrapper as can be seen from the third group of cans in FIG. 1 and also from FIG. 2.

After passing beyond the units 24, the wrapped cans are transferred to a belt conveyor 26 which turns about a pulley 28 at its discharge end. At this time the cans are aligned in a horizontal plane as they lie on the belt 26. As they are carried to the discharge end of this belt conveyor, they are simultaneously, or at least substantially so, tipped into an upright position on a second belt conveyor 32 spaced beneath the first belt conveyor. This tipping action is further illustrated in FIG. 3 where it can be seen that a group of cans passing over the roll 28 will land on the conveyor 32 in an upright position. When the cans are so tipped, they are accurately aligned transversely of the conveyor 32, having previously lain flat on the belt 26. Also the cans are accurately aligned in a heightwise sense, as each rests squarely on the belt 32. The slight free fall to the belt 32 as the cans are tipped is preferred in preventing the beaded edges from overlapping.

FIG. 4 shows alternate means for tipping the cans *c*. It will be seen that a short support plate 34 has been provided at the discharge end of and as a continuation of the first conveyor belt 26. The cans are advanced onto this plate 34 and then tipped over the sharp edge thereof directly onto the second conveyor 32. This eliminates contact of the cans with the belt 26 as it passes around the roll 28 and has, at certain rates of operation, been found more effective in tipping the cans. The length of the plate 34 and particularly the distance of its outer sharp edge from the upper horizontal surface of the belt 26 preferably should not exceed about half the length of the cans so that the cans will tip over the plate 34 and onto the conveyor 32.

The wrapped group of cans is now conveyed by the conveyor belt 32 without any further means changing their relative positions. The belt 32 then conveys the wrapped cans through a heated chamber or heat tunnel 36.

At this point it will be noted that the wrapper *w* is formed of a film of heat shrinkable material, such as irradiated polyvinyl chloride sold under the trademark "Reynolon" by the Reynolds Metal Co. This film will shrink as the wrapped cans are passed through the oven 36, and contract equally or substantially so in all directions so that the cans will be tightly gripped and held in assembled relationship with the cans accurately aligned both in a transverse and vertical sense. Once having had the beads at the opposite ends of the cans aligned, they are held in abutting relation by the shrunk film with at least sufficient security to maintain this relationship during ordinary handling as the cans are packed and then unpacked for eventual display on retail shelves. Thus, without the need of any special filler cards, these groups of cans may be accurately positioned, not only for security in packing for shipment, but for presenting an attractive display appearance on the retail shelves.

Having thus described the invention, what is claimed as novel and desired to be secured by Letters Patent of the United States is:

1. The method of forming packages which comprise a group of like cylindrical articles having beaded flanges at their opposite ends, which method comprises the steps of wrapping a group of such articles in heat-shrinkable film, conveying the articles along a belt conveyor with the articles lying on their sides and in generally parallel rela-

tionship, and then passing the articles over the end of the belt conveyor and tipping them to an upright position on a second conveyor spaced therebeneath to align the articles in a transverse and heightwise sense and then advancing the articles on the second conveyor to a source of heat for shrinking the plastic film to lock the articles of each group in their thus aligned positions.

2. Apparatus for forming packages which comprises means advancing a group of articles having beaded ends, means for loosely wrapping the group of articles in a heat shrinkable film with the articles lying on their sides in side-by-side relation, conveyor means for advancing the so wrapped articles along a horizontal path, a pulley defining the discharge end of said conveyor, means beyond said pulley defining a sharp tipping edge, a second conveyor spaced closely adjacent the discharge end of said first conveyor and therebeneath whereby articles transferred from the first to the second pulleys will be tipped to an upright position to align the articles of each group transversely and in a heightwise sense, and means spaced along the length of said second pulley for applying heat to said film to lock the articles of each group in their thus aligned positions.

3. Apparatus as in claim 2 wherein the tipping edge means comprise a platform beyond said first conveyor as an extension thereof and are spaced immediately above said second conveyor to facilitate the tipping of articles as they are transferred to said second conveyor.

4. Apparatus as in claim 3 wherein the outer end of the platform is spaced from the end of the upper run of said first conveyor a distance approximating half the length of said cans.

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