WHAT IS CLAIMED IS:

1. A product multi-pack comprising:

a plurality of elongate generally circumferentially symmetrically shaped product containers, each having a bottom region, an open top closed by a cap and a tubular wall extending there between, with the wall provided with a label having a front portion extending about a limited section of the wall circumference;

a carton sized to display the plurality of product containers retained therein, the carton having an open face exposing a portion of the product container wall; and

a locator web formed of a thin sheet of plastic having a plurality of spaced apart apertures formed therein and sized to be at least partially elastically deformed when installed over the caps of the product containers;

wherein the locator web provides frictional resistance to rotation of the product containers enabling the containers to be positioned and held in place relative to the carton open face so that the label front portions are visible.

2. The product multi-pack of claim 1 wherein the carton is sized to contain at least two product containers.

3. The product multi-pack of claim 1 wherein the cap of the product containers has an outer diameter that is larger than a corresponding inner diameter of the aperture, such that an interference fit is formed when the cap is inserted into the aperture of the web, the interference fit providing the frictional resistance to rotation of the container.

4. The product multi-pack of claim 1 wherein the web has a width approximately equal to the maximum diameter of the product containers and a length approximately equal to the width multiplied by the number of product containers interconnected by the web.

5. A method of packaging at least two generally circumferentially symmetrically shaped product containers provided with a label having a front portion extending about a limited section of the circumference in an open face carton, comprising:

inserting an end of each of at least two product containers into one of a plurality of spaced apart apertures in a plastic web;

optically sensing the orientation of the product containers;

automatically rotating the product containers to a desired position based on the sensed orientation and the location of the label front portion; and

enclosing the at least two product containers and the interconnecting plastic web into an open face multi-pack carton so that the label front portions of the plurality of product containers are oriented to be visible through the carton open face.

6. The method of claim 5, wherein each aperture elastically deforms when the end of the product container is inserted, thereby the aperture conforms to and frictionally engages the end of the product container.

7. The method of claim 5, wherein a pair of drive members frictionally engage the product containers to automatically rotate the product containers relative to the web so that the label position of the product container when released from the drive members is in a desired position based on the sensed orientation and the location of the label front portion.

8. The method of claim 5, further comprising cutting the web at spaced apart positions between adjacent apertures forming a plurality of product containers interconnected by a web segment with the labels oriented in a desired position.

9. A system of filling a multi-pack carton with plurality of elongate generally circumferentially symmetrically shaped product containers, each having a bottom region, an open top closed by a cap and a tubular wall extending there between, with the wall provided with a label having a front portion extending about a limited section of the wall circumference, the system comprising:

a conveyor for conveying product containers through a series of stations;

a controller for receiving signals from the stations, the controller analyzes the received signals and transmits control signals to the stations in response to the received signals;

a feed station coupled to the conveyer for organizing product containers to be conveyed;

a web application station for installing thin elongate web to the conveyed product containers;

a rotation sensor for measuring a product container indicator position that is indicative of a label orientation and transmitting a corresponding orientation signal to the controller;

a product container alignment station for receiving speed control signals from the controller and operating a pair of drive members in response to the received speed control signals for rotating a series of connected conveyed product containers;

a feed sensor for measuring a longitudinal position of the container and transmitting a corresponding feed signal to the controller;

a web cutting station for receiving cut command signals from the controller and operating a cutting mechanism in response to the received cut command signals for separating the series of connected conveyed product containers into subassemblies of linked product containers;

a carton feed station for receiving a plurality of carton blanks and erecting a carton from each blank;

a transfer station for receiving subassemblies of linked product containers and transferring linked product containers into each carton; and

a carton closing station for closing the carton once filled.

10. The system of claim 9 wherein the product container alignment station further comprises a pair of rotating belts that are each operated by one of the drive members, the belts are generally aligned parallel to each other for simultaneously engaging opposing walls of the conveyed containers.

11. The system of claim 10 wherein the controller compares the orientation signal to a pre determined container orientation to determine the speed required from each of the drive members for rotating the container to the pre determined container orientation.

12. The system of claim 9 wherein the cutting mechanism further comprises a belt drive for rotating a pair of opposing blades.

13. The system of claim 12 wherein each of the opposing blades are generally disc shaped and positioned coplanar relative to each other.

14. The system of claim 12 wherein the belt drive further comprises a motor and a geartrain for simultaneously rotating the pair of opposing blades in opposite directions.

15. The system of claim 9 wherein the cutting mechanism further comprises a blade drive for actuating a pair of opposing blades through an arcuate path to transversely cut the connected product containers.

16. The system of claim 15 wherein the blade drive further comprises a slider crank for converting the controlled rotation of a servo motor into the translation of a transverse axle for actuating the blades.

17. The system of claim 16 wherein the servo motor rotates in increments of at least one hundred and eighty degrees.

18. The system of claim 16 wherein the blade drive further comprises a pair of symmetric linkage assemblies that are coupled to the transverse axle for controlling the actuation of the opposing blades through the arcuate path.

19. The system of claim 18 wherein the pair of symmetric linkage assemblies each include a driven link that couples the transverse axle to the blade and an idler link that couples the blade to a fixed pivot, such that as the transverse axle

translates upward, the driven links pivot upward and the idler links pivot inward, thereby actuating the blades to transversely cut the connected product containers, and as the transverse axle translates downward, the driven links pivot downward and the idler links pivot outward, thereby moving the blades away from the connected product containers.

20. The system of claim 19 wherein a height of the servo motor relative to the conveyor may be adjusted for setting a start location and a stop location of each blade along its arcuate path.

CLAIMS

1. A system for orienting and preparing labeled product containers for a product multi-pack, comprising:

a first conveyance means for conveying the labeled product containers;

a feed station coupled to said first conveyance means for controlling the flow of the labeled product containers along first said conveyance means;

a web application station for continuously applying a web to the labeled product containers, said web formed from a thin elastic polymer and comprising a plurality of apertures, transverse slits and perforations;

a rotation sensor for measuring the rotational position of the labeled product containers using at least one indicator on said labeled product containers to measure said rotational position;

a feed sensor for determining the longitudinal position of the labeled product containers;

an alignment station for selectively rotating the labeled product containers during continuous flow of the labeled product containers;

a cutting station for cutting said web at a predetermined length creating a predetermined set of labeled product containers joined by said web on the labeled product containers;

a transfer station for transferring the labeled product containers to a carton;

a carton erecting station for assembling said carton;

a second conveyance means to convey the cartons from said erecting station to said transfer station;

a controller that receives signals from said rotation sensor and said feed sensor for tracking and directing the position of each said labeled product container.

2. The system of claim 1 wherein said transfer station comprises a transverse dial that receives the product containers in a first position and rotates to a second position whereupon the product containers are ejected.

3. The system of claim 1 wherein said web application station comprises:

a drive sprocket positioned adjacent to said first conveyor for feeding said web; and

an applicator mechanism for installing said web on the product containers.

4. The system of claim 1 wherein the diameter of said apertures of said web are less than the diameter of the cap of the product container.

5. The system of claim 1 wherein said web comprises perforations for cooperation with said drive sprocket.

6. The system of claim 1 wherein said alignment station comprises first and second drive members.

7. The system of claim 6 wherein said first and second drive members are positioned opposite each other and transverse to said first conveyance means.

8. The system of claim 7 wherein said first and second drive members each comprise a rotating belt, wherein said rotating belts frictionally engage opposing walls of the product containers.

9. The system of claim 7 wherein said first and second rotating belts contact up to three product containers simultaneously.

10. The system of claim 6 wherein said controller independently controls the speed of said first and second drive members to rotate the product containers.

11. The system of claim 1 wherein said rotation sensor measures the position of said indicator relative to a pre-determined co-ordinate system.

12. The system of claim 11 wherein said pre-determined co-ordinate system is a 360 degree polar co-ordinate system centered about each product container.

13. The system of claim 1 wherein said indicator is located on the cap of the product container.

14. The system of claim 1 wherein said indicator is located on the label of said product container.

15. The system of claim 1 wherein said indicator is an indentation on the bottom of the product container.

16. The system of claim 1 wherein said controller controls said alignment station to rotate the product containers.