Claims

We claim:

1. A void-fill packaging system comprising:

a manual input device for indicating to the system an estimate of how full a container is;

an electronic controller that provides an output signal that indicates how much dunnage to dispense to the container based on the estimated fullness and one or more characteristics of the container;

a container input device to identify one or more characteristics of a packing container; and

an illustration of different degrees of fill for a container;

where the manual input device includes a device for inputting an estimated degree of fullness of the packing container having one or more articles to be packed correlated with the illustration; and where the controller is in communication with the container input device and the manual input device, and determines the quantity of dunnage to dispense to the container based on the input estimated degree of fullness and the input container identity.

2. A system as set forth in claim 1, where the controller provides an output signal indicating a quantity of dunnage to dispense to the container based on a signal from the manual input device and a signal from the container input device.

3. A system as set forth in claim 1, where the illustration includes one or more of: (a) indicia representing at least two input options; and (b) indicia representing a substantially continuous range of input options between empty and full.

4. A system as set forth in claim 1, where the container input device includes or more of: (a) a sensor to indicate a dimension of a container; and (b) a scale to weigh a container at the packaging station, where the controller can

compare the weight of the container to a freight rate schedule, to determine how much less dunnage should be dispensed to reach a lower freight rate and to output a signal representing the reduced amount of dunnage in addition to the output signal that indicates how much dunnage to dispense to the container based on the estimated fullness and the one or more characteristics of the container.

5. A system as set forth in claim 1 or any other claim that depends from claim 1, where the manual input device includes one or more of: (a) means for selecting a discrete input option from multiple input options representing relative degrees to which a container is filled by one or more products to be packaged; and (b) one or more of a position sensor, and one or more switches, to indicate the relative degree of fullness of the container; and (c) a variable fullness-level indicator with multiple input options between empty and full.

6. A system as set forth in claim 1 or any other claim that depends from claim 1, where the manual input device provides one or more of: (a) about two to about five discrete input options; (b) a range of input options between empty and full; (c) a substantially continuous range of input options between empty and full; and (d) input options that include empty, 25% full, 50% full, 75% full, and full.

7. A system as set forth in claim 1 or any other claim that depends from claim 1, comprising a dunnage dispenser in communication with the controller to dispense the indicated quantity of dunnage; where the dunnage dispenser includes one or more of: (a) a conversion machine that converts a stock material into a dunnage product; and (b) a dunnage dispensing input device to manually dispense dunnage.

8. A method for controlling an amount of dunnage to be dispensed to a packing container, comprising the steps of:

identifying one or more characteristics of a container where one or more articles are placed in the shipping container;

manually inputting an estimated degree of fullness for the container;

providing an output signal indicating a quantity of dunnage to dispense to the container based on the estimated degree of fullness and the one or more identified characteristics of the container

where the manually inputting step includes one or more of the following steps: (a) positioning a body adjacent an illustration of an estimated degree of fullness so that the position of the body can be sensed; (b) selecting from about two to five discrete input options; (c) selecting from discrete input options that include empty, 25% full, 50% full, 75% full, and full; and (d) selecting from discrete input options that include nearly empty, half full, and nearly full.

9. A method as set forth in claim 8, comprising one or more of the following: (a) where the identifying step includes sensing one or more dimensions of a container; (b) the step of dispensing the indicated quantity of dunnage based on the output signal; (c) the step of determining an empty volume of the container based on the identified characteristics of the container; (d) the step of determining a void volume of the container based on the determined empty volume of the container and the estimated relative degree of fullness of the container; and (e) the step of manually dispensing a quantity of dunnage.

10. A method as set forth in claim 8, where the providing step includes one or more of the following steps: (a) transmitting the output signal to a dunnage dispenser to dispense the indicated quantity of dunnage; and (b) transmitting the output signal to a dunnage conversion machine to convert a stock material into a dunnage product to dispense the indicated quantity of dunnage.

Claims

1. A void-fill packaging system comprising

an illustration of different degrees of fill for a container,

a manual input device for indicating to the system an estimate of how full a container is,

a container input device to identify one or more characteristics of a container, and to input identified characteristics, and

an electronic controller that provides an output signal that indicates how much dunnage to dispense to the container based on the estimated fullness and one or more characteristics of the container,

where the manual input device includes a device for inputting an estimated degree of fullness of the container having one or more articles to be packed correlated with the illustration; and

where the electronic controller is in communication with the container input device and the manual input device, and determines the quantity of dunnage to dispense to the container based on the input estimated degree of fullness and the input container identity.

2. The system as set forth in claim 1,

where the electronic controller provides an output signal indicating a quantity of dunnage to dispense to the container based on a signal from the manual input device and a signal from the container input device.

3. The system as set forth in claim 1 or 2,

where the illustration includes one or more of:

(a) indicia representing at least two input options; and

(b) indicia representing a substantially continuous range of input options between empty and full.

4. The system as set forth in any one of claims 1 to 3,

where the container input device includes one or more of:

(a) a sensor to indicate a dimension of a container; and

(b) a scale to weigh a container at the packaging station,

where the electronic controller compare the weight of the container to a freight rate schedule, to determine how much less dunnage should be dispensed to reach a lower freight rate and to output a signal representing the reduced amount of dunnage in addition to the output signal that indicates how much dunnage to dispense to the container based on the estimated fullness and the one or more characteristics of the container.

5. The system as set forth in any one of claims 1 to 4,

where the manual input device includes ,as a means for inputting an estimated degree of fullness, one or more of:

(a) means for selecting a discrete input option from multiple input options representing relative degrees to which a container is filled by one or more products to be packaged;

(b) one or more of a position sensor, and one or more switches, to indicate the relative degree of fullness of the container; and

(c) a variable fullness-level indicator with multiple input options between empty and full.

6. The system as set forth in any one of claims 1 to 5,

where the manual input device provides one or more of:

(a) discrete input options;

(b) a range of input options between empty and full;

(c) a substantially continuous range of input options between empty and full; and

(d) input options that include empty, 25% full, 50% full, 75% full, and full.

7. The system as set forth in any one of claims 1 to 6,

comprising a dunnage dispenser in communication with the electronic controller to dispense the indicated quantity of dunnage;

where the dunnage dispenser includes one or more of:

(a) a conversion machine that converts a stock material into a dunnage product; and

(b) a dunnage dispensing device to manually dispense dunnage.

8. A packaging system comprising

means for illustrating different degrees of fill for a container,

means for manually inputting a relative degree to which a container is filled by one or more products to be packaged,

means for identifying one or more characteristics of a container, and

means for outputting a signal indicating the quantity of dunnage to dispense based on the manually input relative degree of fill and the identified characteristics of the container,

where the means for manually inputting includes means for inputting an estimated degree of fullness of the container having one or more articles to be packed correlated with the means for illustrating; and

where the means for outputting is in communication with the means for identifying and the means for manually inputting, and determines the quantity of dunnage to dispense to the container based on the input estimated degree of fullness and the input container identity.

9. A method for controlling an amount of dunnage to be dispensed to a container, comprising the steps of:

identifying one or more characteristics of a container where one or more articles are placed in the container;

manually inputting an estimated degree of fullness for the container; and

providing an output signal indicating a quantity of dunnage to dispense to the container based on the estimated degree of fullness and the one or more identified characteristics of the container,

where the manually inputting step includes one or more of the following steps:

(a) positioning a container adjacent an illustration of an estimated degree of fullness so that the position of the container can be sensed;

(b) selecting from discrete input options;

(c) selecting from discrete input options that include empty, 25% full, 50% full, 75% full, and full; and

(d) selecting from discrete input options that include nearly empty, half full, and nearly full.

10. The method as set forth in claim 9,

comprising one or more of the following:

(a) where the identifying step includes sensing one or more dimensions of a container;

(b) the step of dispensing the indicated quantity of dunnage based on the output signal;

(c) the step of determining an empty volume of the container based on the identified characteristics of the container;

(d) the step of determining a void volume of the container based on the determined empty volume of the container and the estimated relative degree of fullness of the container; and

(e) the step of manually dispensing a quantity of dunnage.

11. A method as set forth in claim 9 or 10,

where the providing step includes one or more of the following steps:

(a) transmitting the output signal to a dunnage dispenser to dispense the indicated quantity of dunnage; and

(b) transmitting the output signal to a dunnage conversion machine to convert a stock material into a dunnage product to dispense the indicated quantity of dunnage.