PROCESS OF EXPEDITING ACTIVATION OF HEAT-EXPANDABLE ADHESIVES/COATINGS USED IN MAKING PACKAGING SUBSTRATES

REFERENCE TO EARLIER FILED APPLICATION

[0001] This application claims the benefit under 35 U.S.C. § 119(e) of U.S. Provisional Patent Application No. 61/379,030, filed 1 September 2010, and titled "PROCESS OF EXPEDITING ACTIVATION OF HEAT-EXPANDABLE ADHESIVES/COATINGS USED IN MAKING PACKAGING SUBSTRATES," which is incorporated, in its entirety, by this reference.

BACKGROUND

[0002] Consumers frequently purchase ready-made products, such as food and beverages and other products, in containers made from packaging substrates. Thermally-insulated containers may be designed for hot or cold liquids or foods, such as hot coffee, iced-tea, or pizza. These containers may maintain the temperature of the liquid or food contents by reducing heat or cold transfer from the contents to the hand of the consumer.

[0003] To help insulate the hand of the consumer from the heat or cold of the contents of a food or beverage container, heat-expandable adhesives and coatings have been developed for micro-fluted board or other packaging substrates. Such expandable adhesives and coatings expand upon being heated over a certain temperature.

BRIEF SUMMARY

[0004] According to a first aspect of the present invention, there is provided a method for manufacturing a multilayer substrate for packaging, the process comprising: passing a first, flat sheet material into a conveyor, machine system, the first sheet material having at least two sides; corrugating the first sheet material; applying a first securing material to corrugated flutes of a side of the first sheet material, the securing material comprising a heat-expandable adhesive composed of starch or a binder mixed with heat-expandable microspheres; applying a second, flat sheet material to the side of the first sheet material; heating the first and second sheet materials with an industrial microwave heater while the first and second sheet materials

remain flat, thereby causing to expand the heat-expandable adhesive and forming the multilayer substrate; and processing the multilayer substrate into a final product.

[0004a] According to a second aspect of the present invention, there is provided a method for manufacturing a multilayer substrate for packaging, the process comprising: passing a first, flat sheet material into a conveyor, machine system, the first sheet material having at least two sides; corrugating the first sheet material; applying a first securing material to corrugated flutes of a first side of the first sheet material; applying a second, flat sheet material to the first side of the first sheet material; applying a second securing material to a second side of the first sheet material or to the second sheet material, the second securing material comprising a heat-expandable coating composed of starch or a binder mixed with heat-expandable microspheres; heating the first and second sheet materials with an industrial microwave heater while the first and second sheet materials remain flat, thereby causing to expand the heat-expandable coating applied thereto; applying a third, flat sheet material to the first and second sheet materials to form the multilayer substrate; and processing the multilayer substrate into a final product.

[0004b] There~~A method~~ is disclosed a method for heating up sheet or roll web material ("sheet material") and other substrates for containers with a microwave heater during the manufacturing process, causing a heat-expandable adhesive or coating applied to the sheet material or substrates to rapidly expand, expediting activation thereof. The heat-expandable adhesive or coating expands to provide insulation and rigidity to the material, which may helps converting the materials to packages or containers, and may keeps fluid and solid contents of the containers cold or hot, and to insulate such contents from human contact during handling of the containers. The method may be~~is~~ fully automated and uses roll and or other sheet materials such as single face material and