

Patent alert February 2025

Extrusion- and hotmelt-coating as circular plastic-coated textiles

This month's selection illustrates focusses on hotmelt and extrusion coating methods for textiles. Both extrusion-coating and textile coating are solvent-free methods where both textiles and plastics meet. Using these methods, melted polymer is coated onto textile. These methods enable to obtain mono materials products which are then easier to recycle. Moreover, both methods are suitable for a wide range of polymer chemistries and viscosities. Therefore, these melt-coating methods can be used to manufacture multi material products based on polymers which are compatible and may be recycled in the same waste streams. Although extrusion is more commonly used, hotmelt which requires lower viscosity polymers is also explored.

Contents

Extrusion- and hotmelt-coating as circular plastic-coated textiles	1
Polyester tufted carpet with polyester extrusion coating	2
Process of thermal transfer using hot melt adhesive lamination for forming a carpet backing and finished carpet or tile product.....	3
Lamination process and using coated fiber cores to create an adhesive layer and/or a reinforcement layer	4
Tubular irrigation device and method of making the same.....	5
Drainage housewrap	6
Inflatable assembly and method of manufacturing an inflatable assembly	7
Woven irrigation tubing, apparatus and method of making same.....	8
Coated airbag	9

Polyester tufted carpet with polyester extrusion coating

Patent number: US11746467

Publication date: 2023-09-05

Applicant(s): AURIA SOLUTIONS UK I LTD

Inventor(s): WILSON ERNEST FRANKLIN; ALLISON TIMOTHY JOEL; SIMMONS SEAN BRACKEN

Summary

Tufted fabrics, such as carpets and rugs, are generally made of numerous components and types of materials. Typically, in the tufting operation, yarn is inserted into a first or upper side of the primary backing material. The second or bottom side of the primary backing is then typically coated with a latex in order to adhere the yarn to the backing. Such latex may include a synthetic latex such as a styrene-butadiene latex composition. Carpets having such configuration can be relatively difficult to recycle and may often be disposed in landfill.

The present invention is directed at polyester tufted carpet where the tufts are engaged with a primary polyester backing and where a polyester extrusion coating is applied to the backside of the primary backing to lock the tufts. Such configuration therefore avoids the use of a latex adhesive coating. Such coating process can also be made continuous. In a preferred method form, the present invention stands directed at a method for manufacturing a polyester carpet, comprising the steps of providing polyester yarn, providing a primary polyester backing and tufting the polyester yarn into the primary backing. This may then be followed by extruding a polyester backing onto the back side of the primary backing to form a secondary polyester backing that locks the polyester tufts in place. Such carpet construction is therefore formed entirely of polyester polymer.



Source image: <https://www.auriasolutions.com/products/trunk-frunk-cargo-management/>

Process of thermal transfer using hot melt adhesive lamination for forming a carpet backing and finished carpet or tile product

Patent number: US8443857

Publication date: 2013-05-21

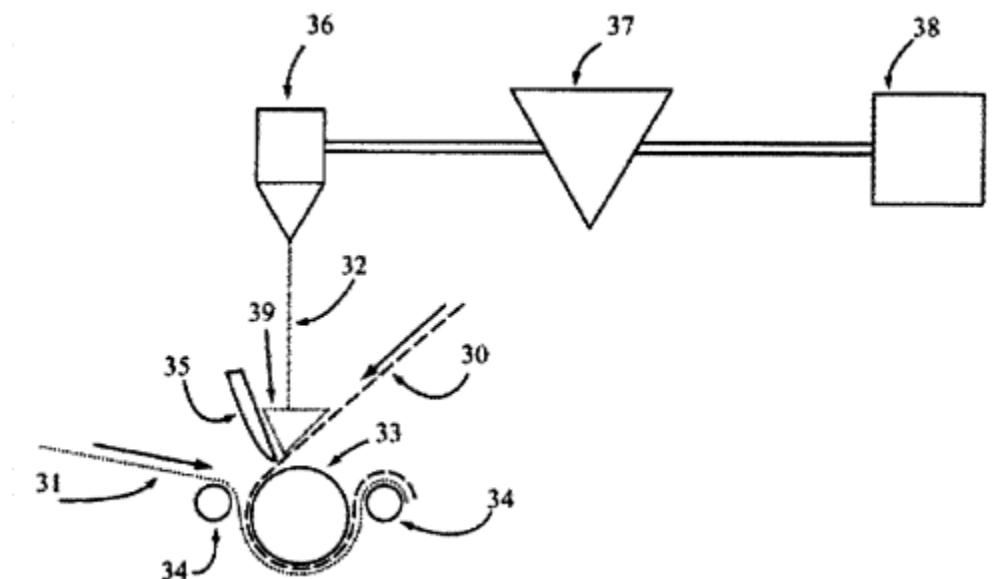
Applicant(s):, BEAULIEU GROUP, ENGINEERED FLOORS

Inventor(s): DONEY GRANT WILLIAM; HARRIS ROGER; SALSMAN ROBERT KEITH

Summary

The primary component of conventional broadloom carpet products such as carpet tiles is tufted “greige” carpet. Greige carpet generally comprises fiber tufts looped around a primary backing fabric. Primary backing fabrics may be woven, nonwoven, or spun bonded natural or synthetic materials. The tufted loops of fiber may be left intact or sheared so that the upright face fibers, or pile, are left with random ends facing outwards on the visible wear surface, or face side, of the carpet.

One embodiment is a method for binding a greige carpet comprising a face side and a back side with a secondary backing material using a hot melt adhesive. The hot melt adhesive can be applied to the secondary backing material to form an adhesive-loaded secondary backing material. The adhesive-loaded secondary backing material then can be contacted with a heated application roll to form a secondary backing material on the heated application roll. The back side of the greige carpet then preferably is pressed against the secondary backing material on the heated application roll to form a finished carpet.



Lamination process and using coated fiber cores to create an adhesive layer and/or a reinforcement layer

Patent number: US11701815

Publication date: 2023-07-18

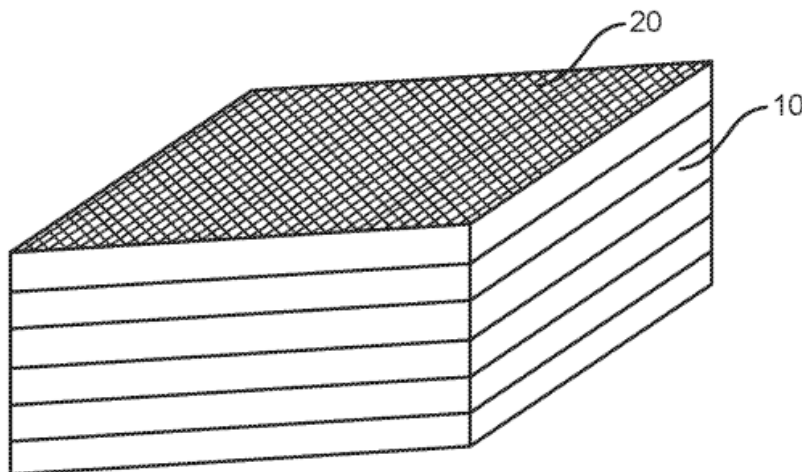
Applicant(s): BARNES DALE; PHIFER INCORPORATED

Inventor(s): BARNES DALE

Summary

Lamination is the technique/process of manufacturing a material in multiple layers, so that the composite material achieves improved strength, stability, sound insulation, appearance or other properties from the use of differing materials. A laminate is a permanently assembled object composed of layers that are joined together by heat, pressure, sonic or RF welding, and/or adhesives and binders. In current laminate processes, multiple materials are joined in an effort to result in a desired monolithic structure. These processes use a variety of methods to create contact of and adhesion of the multiple layers and the addition of characteristic modifiers. Each layer has a specific role in the formation of an end product that meets the application needs and requirements. In resin layers, components that are of similar nature can be joined by applying the necessary process conditions. In most lamination processes this involves application of one or more of heat, pressure and/or vacuum, and the adhesive. The pressure and vacuum or pressure permit the layered structure to compress for good contact between layers, while heat is used to assist the resin or adhesives, to melt and flow, and the layers themselves to bind to adjacent layers.

The invention includes a method of providing an intermediary layer in a laminated structure, between two adjacent layers, where the intermediary layer contains a fiber having an extrusion coating. The intermediary layer may form a textile constructed from the fibers, the intermediary layer, when the lamination method proceeds, provides the adhesion between the adjacent layers, as well as reinforcement for the laminated structure.



Tubular irrigation device and method of making the same

Patent number: US12188582

Publication date: 2025-01-07

Applicant(s): SILVERPACK LLC

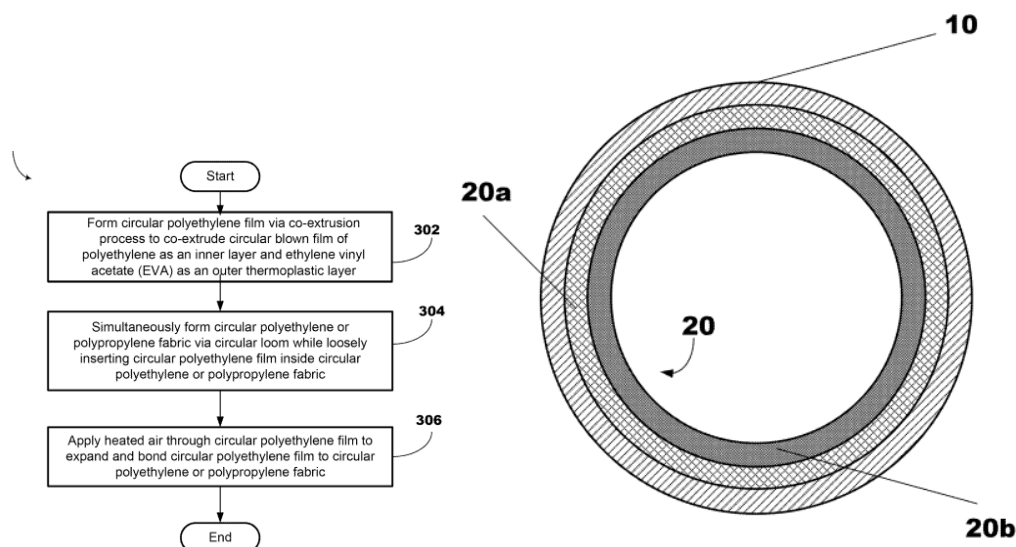
Inventor(s): PLATA CARLOS

Summary

Various irrigation mechanisms have been used for the irrigation of extensive crops. One of the most commonly used methods is to pump water through a network of flexibles plastic pipes that will have man made holes or outlets through which the water will exit and then flow with gravity and according to the grade of the field in order to irrigate the full farm. The plastic pipe allows for water to be transported to the desired locations without suffering losses by filtration and evaporation and avoiding the need of dredging specialize channels.

The present disclosure relates to a tubular irrigation device, such as a pipe or sleeve, that allows for the supply of water to extensive crops by irrigation by pressure to subsequently flood the furrows by gravity. The device disclosed herein avoids the need to frequently replace the sleeves used for irrigation of extensive crops due to its superior tear resistance that translate to higher water pressure resistance. Furthermore, it allows a roll of the same diameter to contain more linear quantity of the tubular device to reduce the number of rolls needed in installation. For this reason, the tubular device of the present application decreases costs and downtime related to the mounting of each roll to the installation system.

In an embodiment disclosed herein is a method for making a tubular irrigation device comprising: obtaining flat film bobbins one or more than one polymeric layers in a blown film polyethylene co-extrusion line or flat film polypropylene co-extrusion line; weaving polyethylene or polypropylene circular fabric using a tapeline extruder and circular looms; coating the flat film bobbins onto the outside of the circular fabric in an extrusion coating machine to adhere the flat film to the circular fabric; unwinding the roll produced from the extrusion coating machine to the predetermined length; and inverting in an inversion machine to position the flat film as the inner layer.



Drainage housewrap

Patent number: US11760052

Publication date: 2023-09-19

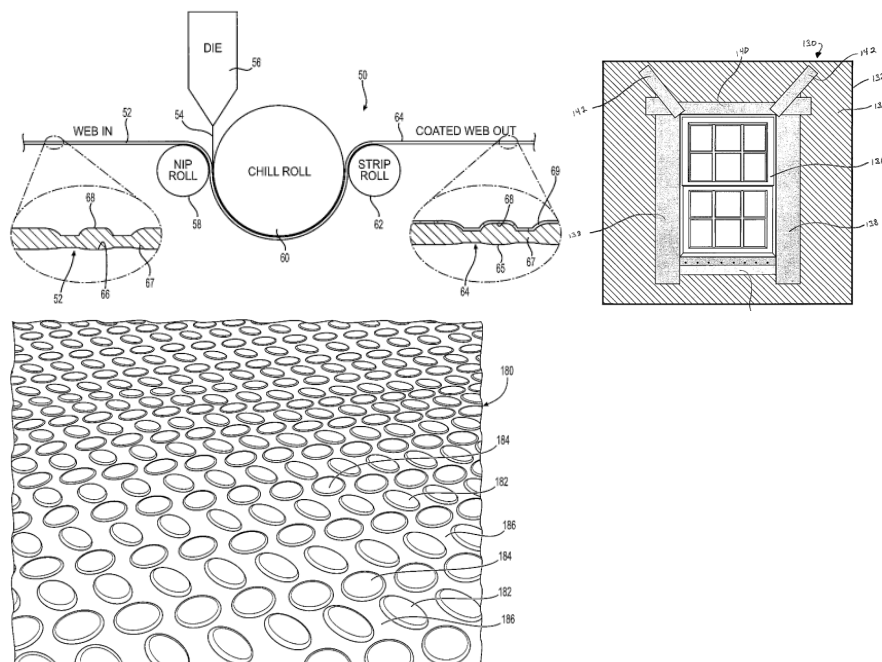
Applicant(s): SPECIALTY COATING & LAMINATING LLC

Inventor(s): BALDWIN GEOFFREY M.; ANDERSON ROBERT C.

Summary

The present invention is directed to a multi-layer housewrap that prevents liquid water from passing through into a house, yet the housewrap is still breathable to allow water vapor to pass through it. Further, the housewrap has a textured surface in the form of channels which allow water on the surface of the housewrap to drain down by gravity.

The housewrap described herein is a multi-layer drainage wrap. A nonwoven base web has a three-dimensional pattern embossed therein on one surface of the web. This embossed web is then extrusion coated with a polymer coating. The coating is extrusion-coated on to embossed side of the nonwoven base web. The nonwoven base web has the three-dimensionally embossed and coated side as its outward facing surface. The coated base web is then activated by stretching to provide moisture vapor permeance at a rate that allows a building to breathe. The result is a housewrap that is textured on both the inside and outside faces of the housewrap. The texture and weather resistive coating on exterior side facilitates both drainage of water off of the outside face of the housewrap and the circulation of air and moisture around and through the inside face of the housewrap and promotes a tighter seal and better adhesion to flashing tapes reducing further the points of entry for water into the structure.



Inflatable assembly and method of manufacturing an inflatable assembly

Patent number: FR3151619

Publication date: 2025-01-31

Applicant(s): COMPAGNIE GENERALE DES ETABLISSEMENTS MICHELIN

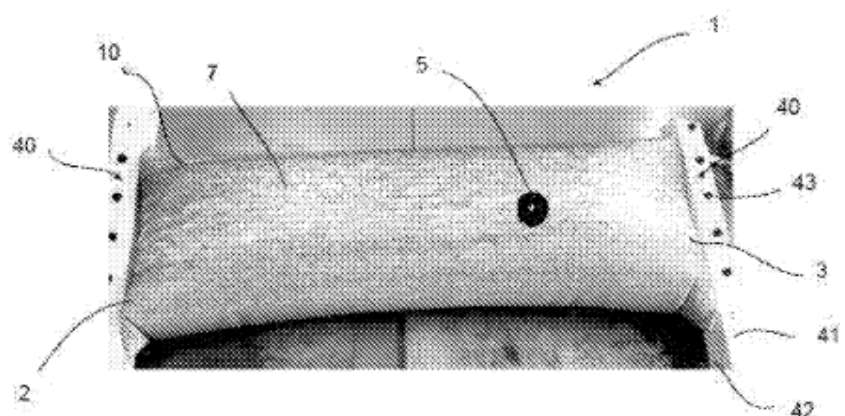
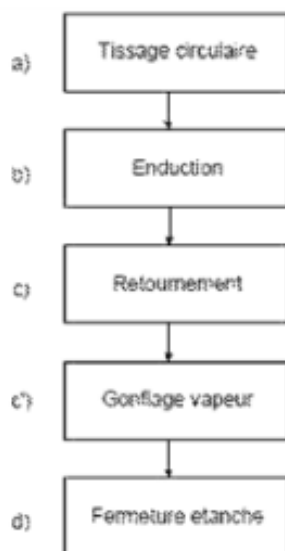
Inventor(s): MBIAKOP NGASSA ARMEL; ODIER MATTHIAS; DELEPIERRE GWENDOLINE; ESPELAND JOHN

Summary

The present invention relates to the field of inflatable assemblies used in inflatable structures, structures of the type comprising at least one inflatable assembly forming a beam which constitutes the framework of the enclosures, shelters or inflatable tents when the framework is covered with a canvas, or structures of the type comprising one or more inflatable assemblies assembled together and used in the manufacture of furniture or floating objects.

The present invention proposes an inflatable assembly comprising a tubular textile support made of a seamless fabric, said support being covered with a layer of coating made of a thermoplastic polymer material and being closed at its ends so as to obtain a chamber impervious to an inflation gas, in which walls of said chamber have a surface density of less than 1000 g/m². The objective of the invention is also achieved with a method of manufacturing an inflatable assembly, characterized in that it comprises the following steps in the order: a) producing a tubular textile support without sewing by circular weaving, b) coating by extrusion a layer of thermoplastic polymer material of the support produced in the preceding step, c) turning over the support coated in the preceding step, and d) closing the ends of said support after having provided for an inflation valve to be installed.

The average thickness of said coating layer may be between 0.4 and 0.8 mm and may preferably be equal to 0.6 mm. The material used for the coating layer may be thermoplastic polyurethane, preferably based on polyether polyols. Such a material has good adhesion to the support tissue and has excellent resistance to microbiological and fungal attacks which may be due to the microorganisms present in the inflation gas.



Woven irrigation tubing, apparatus and method of making same

Patent number: US11746934

Publication date: 2023-09-05

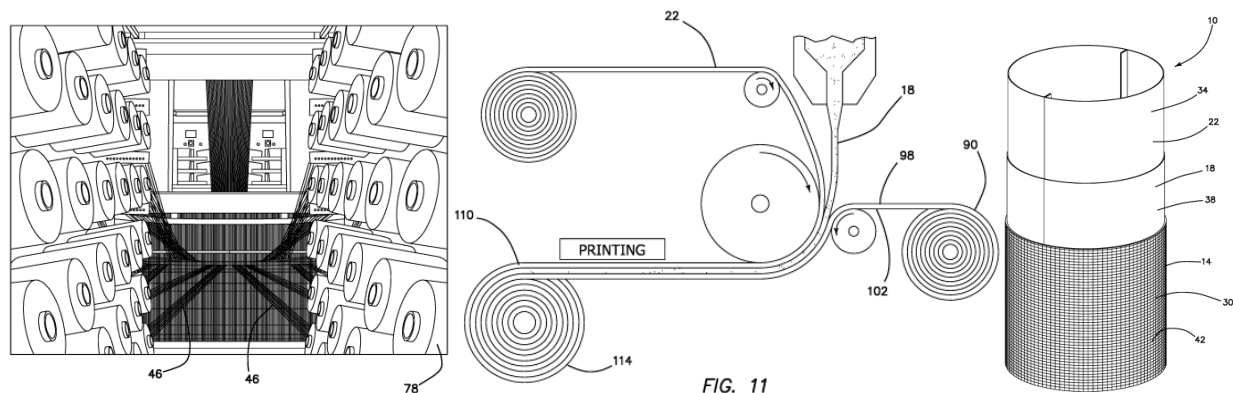
Applicant(s): DELTA PLASTICS OF THE SOUTH

Inventor(s): MITCHELL MICHAEL

Summary

Various methods have been developed for crop irrigation. Many of these methods involve aerial spraying of water. Spraying irrigation systems have been found to lose as much as 40% of the water sprayed due to evaporation. Drip style irrigation systems have been developed which work with an inclined and furrowed field in which an irrigation tube with spaced drip openings is disposed orthogonally to the furrows and water is pumped into the tube. The amount of pressure which the tubing can accommodate relates to the size of the field that can be irrigated by a single tube. Early irrigation tubing systems were limited to pressures of approximately one foot of head. As this type of irrigation tubing has a finite life, it is desirable that the tubing material be recyclable. While the early tubing systems used polyethylene plastic that is recyclable, later designs that can accommodate higher pressures have been made with polyethylene plastic which is not recyclable. The present invention addresses these problems by providing an irrigation tubing system that can accommodate substantially higher pressures while being manufactured of completely recyclable materials.

Woven irrigation tubing comprising a woven, extrusion coated & laminated tube formed of a high-density polyethylene (HDPE) outer layer, a low density polyethylene (LDPE) middle layer and a linear low density polyethylene (LLDPE) inner layer. The finished tubing is treated for ultraviolet resistance. The tubing is tied off at a distal end with a proximal end connected to a pressurized irrigation source. Watering holes are created in the tubing at spaced intervals and the resulting water streams are directed into parallel plowed furrows. The tubing is completely recyclable. The tubing is formed by manufacturing tape for the woven outer tubing cover, stretching the tape along its length to strengthen it, weaving the outer layer from the tape, flattening the woven outer layer, extrusion coating each surface of the outer layer with LDPE, laminating the LLDPE inner layer to the LDPE, reversing and winding the tubing for storage and distribution.



Coated airbag

Patent number: US9079558

Publication date: 2015-07-14

Applicant(s): CROUCH EARL; GLOBAL SAFETY TEXTILES LLC

Inventor(s): CROUCH EAR

Summary

In accordance with the present invention, a coated airbag is provided. In another aspect, a method of extrusion coating an air impermeable material onto a one-piece woven airbag fabric is employed. Another aspect preheats a fabric such that the fabric remains hot during a coating application thereon. Furthermore, a machine for making and coating an airbag fabric is also provided. In yet another aspect, a vehicular airbag has a one-piece woven construction with an outer coating of high molecular weight, thermoplastic material.

The present coated airbag, machine and methods are advantageous over traditional constructions, machines and processes, since the present airbag employs considerably less expensive coating materials while achieving superior performance. The materials employed for the present coating (and entire airbag) are also recyclable, thereby reducing scrap costs, and the coating is easily applied in a uniformly thick manner that is independent of fabric weaving variations. Additionally, lighter weight coating materials are used in the present system, especially as compared to more expensive silicone materials, but without sacrificing performance. This also allows for a reduced packaging size for the final airbag in the vehicle.

