

Claims

1. A fluid container composed of at least two layers (11, 12) of a cardboard composite material of kraft paper (18) wound into a hollow cylinder as a can body (2) in a direction perpendicular to the axis thereof, the edges of which either meet edge-to-edge for the innermost layer in the winding direction, while the innermost film of the innermost layer, namely the barrier layer, overlaps the kraft paper (18) at the edges thereof in the winding direction, or else the edge regions of the innermost layer overlap in the winding direction as a whole, wherein in both cases, after right-angled angling from the wound layer (11), the overlaps abut each other with the barrier layers thereof and are welded together and then folded over to one side of the layer and glued together therewith, while the edge regions overlap in the wrapping direction in each other layer (14, 12), wherein the overlapping regions (45) are cut or ground at an oblique angle to form an inclined surface (44) or a step (21) over the thickness thereof so that the overlapping areas lie against one another with a positive fit and the overlapping areas (45) are no thicker than the thickness of the cardboard composite material itself, and that the connecting seams (15, 16) of the at least two layers (11, 12) of cardboard composite material lie in offset locations with respect to the circumference of the windings, and further that one side (6) of the thus formed open hollow cylinder is closed with a base element (4) and the other open side (7) of the hollow cylinder or can body is closable or closed with a cover (5) with stopper in the same way after filling.
2. The fluid container (1) according to claim 1, *characterised in that* the wound innermost layer (11) comprises an inner seam (15) and is formed by a kraft paper layer (18) which on the side facing the can interior (3) is coated with a gas-tight and aroma-tight barrier composite (20), wherein this barrier layer of polypropylene PP, polyethylene PE, or an aluminium foil overlaps the edges of the kraft paper layer (18) in the winding direction and after an angling at the seam is welded in a sealing manner with the adjacent angling away of the barrier layer of the neighbouring seam and then folded over the outside of the wound layer, and the wound outer material layer (12) is formed from a kraft paper layer (18) and the outer seam (16) thereof is sealed with a sealing strip (46) extending along this outer seam (16).
3. The fluid container (1) according to one of the preceding claims, *characterised in that* the base element (5) comprises an outer edge which is rolled up in a sealing manner around an initially radially projecting edge of the superimposed layers of the hollow cylinder or can body (2), so as to form a tightly sealed rolling up which is round in cross-section (43) along the axial edge of the hollow cylinder or can body (2), and that the other open side (7) of the hollow cylinder or can body (2) is likewise closable or closed after filling with a cover element (6) with stopper.
4. The fluid container (1) according to one of the preceding claims, *characterised in that* the seams (17, 16) of each material layer (14, 12) except the innermost layer (11) have an overlapping region (10) extending stepwise over the thickness of the layer which extends over the entire height of the fluid

container (1), and these seams (17, 16) have a width of 1 mm to 6 mm, preferably 3 mm, and that all layers (11, 14, 12) are glued together over the entire surface.

5. The fluid container (1) according to one of the preceding claims, *characterised in that* the seams (17, 16) of each material layer (14, 12) except for the innermost layer (11) comprise an overlapping region (10) which runs obliquely over the thickness of the layer, which extends over the entire height of the fluid container (1) and these seams (17, 16) have a width of 1 mm to 6 mm, preferably 3 mm, and that all layers (11, 14, 12) are glued together over the entire surface.
6. The fluid container (1) according to one of the preceding claims, *characterised in that* the kraft paper layer (18) of the outer material layer (12) is coated on one side on the side facing away from the can interior (3) with a polyolefin layer (19) as a barrier composite and has a basis weight of at least 10 g/m² and at most 40 g/m², and contains either polyethylene or polyethylene terephthalate.
7. The fluid container (1) according to any one of the preceding claims, *characterised in that* the kraft paper layer (18) of the outer material layer (12) is formed on one side on the side facing away from the can interior (3) to be printable or paintable in a water-resistant manner.
8. The fluid container (1) according to one of the preceding claims, *characterised in that* the barrier composite comprises a polyolefin layer (19) and at least one layer of an adhesion promoter.
9. The fluid container (1) according to one of the preceding claims, *characterised in that* the barrier composite additionally comprises a layer of aluminium and has a total basis weight of at least 60 g/m² and at most 130 g/m².
10. The fluid container (1) according to one of the preceding claims, *characterised in that* the barrier composite additionally comprises a layer of ethylene-vinyl alcohol copolymer and has a total basis weight of at least 50 g/m² and at most 100 g/m².
11. The fluid container (1) according to one of the preceding claims, *characterised in that* the barrier composite of the outermost layer (12) comprises a layer of polyvinyl alcohol and has a total basis weight of at least 50 g/m² and at most 100 g/m².
12. The fluid container (1) according to one of the preceding claims, *characterised in that* a respective kraft paper layer (18) has a basis weight of at least 60 g/m² and at most 180 g/m² and the base element (4) and/or the cover element (5) is made of metal, preferably of aluminium.
13. A method for on-demand, timely production of such a fluid container, suitable as a beverage can (1), at the filling location, *characterised in that* the container or can body (2) is created from at least two layers (11, 12) of windings made of cardboard composite material of kraft paper (18) wound perpendicular to the

can body to be created (2), wherein the connecting seams (15, 16) of the windings are at different locations of the can circumference and the edge regions of the windings of the cardboard composite material for the innermost layer (11) are joined together at the seam or by three-ply overlap, with barrier layers which are welded tightly together and are located on the inside of the wound layer and project over same by several millimetres, by welding the same to the angled portions radial to the wound layer and then folded over the wound layer, and the edge regions of each other layer (12, 14) are either bevelled or cut over the thickness thereof in the angular direction or in a step (21) in the winding direction, so that these edge regions overlap each other in a positive fit manner and the thickness thereof corresponds to the thickness of the respective cardboard composite material, and the several layers of windings are wound onto each other at the same time and location so that the seams come to rest at different circumferential positions, and subsequently tube sections (28) of a desired length are cut as can bodies (2) from the endless tube (27) thus produced at a right angle to the axis of the winding, and one side (6) of these can bodies (2) is equipped with an insertable base element (4), the edge region (41) of which is rolled up together with the edge (42) of the can body (2), and then the can (1) is filled and finally a cover element (5) is rolled with the edge of the can body in the same manner as for the base element (4).

14. The method according to claim 14, *characterised by* the following steps:

- a. Rolling at least two rolls of cardboard composite material (11, 14, 12) and coating the two sides of the two material webs with glue (22);
- b. for layers not to be wound on the seam, cutting or grinding the longitudinal edges of the webs of cardboard composite material (11, 14, 12) into a slope (44) or a step (21) in each case, so that upon overlapping the two longitudinal edges are superimposed on the same in a positive fit manner by rolling on a steel mandrel (23) and the overlap region (45) ends up not being thicker than the material web itself;
- c. Feeding and pulling along of the innermost layer (11) of the cardboard composite material along a stationary cylindrical steel mandrel (23) and winding the same circumferentially on a seam in a machine station, by passing the cardboard composite material (25) between steel mandrel (23) and a plurality of contiguous rollers (24) each with a U-shaped cross-section which run along a peripheral region of the steel mandrel (23) in a snugly fitting manner, and welding together the barrier composite layers which protrude from the seam and applying the superimposed, welded and protruding barrier layers on the outside of the winding and pressing the same by means of pressure rollers (40), simultaneously feeding and pulling along the second layer (14) and third layer (12) of cardboard composite material (25) in a slightly locationally recessed manner in the same machine station along the stationary cylindrical steel mandrel (23) while winding the first wound layer in the circumferential direction by means of passing the cardboard composite material (25) between the first wound layer on the steel mandrel (23) and a plurality of contiguous rollers (24) each having a U-shaped cross section, and winding the second wound layer in the circumferential direction by passing the cardboard composite material (25) between the second wound layer on the steel mandrel (23) and the same plurality of contiguous rollers (24), each

having a U-shaped cross-section, which run in a snugly fitting manner on a peripheral region of the respective wound layer on the steel mandrel (23) so that the edge regions of the material web (25) overlap in a positive fit manner and

- d. Optionally feeding another layer simultaneously and in a slightly locationally recessed manner exactly as in c. into the same machine station;
- e. Further conveying the multilayer cardboard composite material now wound to an endless tube (27) over an end portion of the steel mandrel (23) in a synchronised back-and-forth-movable guillotine (26) which when travelling with the tube (27) at desired locations thereof cuts the same into tube sections (28) of a desired length, or further conveying into a multi-rotary knife machine with a synchronised back-and-forth-movable carriage having multiple rotary blades for a simultaneous cutting of the supplied endless tube (27) into several tube sections of a desired length,
- f. Forming of projecting edges (42) on the open tube sections (28) by the rotation of spreading tools from both sides and spreading onto the spread edges (42) of a dispersion adhesive in the form of a liquid polyethylene PE or other fast-setting and food grade adhesive such that moisture cannot penetrate into the interior of the kraft paper layer;
- g. Placing the tube sections (28) in an upright position in a row in a conveyor channel (29);
- h. Driving through a carousel (30) on which an automatic unit (32) inserts from a supply magazine (31) a single base element (4) into the open-top side of each tubular section (28) and the outer edge thereof projecting radially outward in the radial direction around the edge region of the open tube section (28) is crimped in a sealing manner,
- i. Dropping the tube sections (38) which are open on one side into the conveyor channel, so that their now open side is on top;
- j. Passing through a carousel filling station (33) which fills each tube section (28) with a defined filling quantity,
- k. Driving through a carousel (34) on which an automatic unit (35) inserts from a supply magazine (36) a single cover element (5) with pull ring stopper into the open top side of each filled tube section (28) and the outer edge of the cover element (5) projecting axially outward in the radial direction around the edge region of the open tube section (28) is crimped in a sealing manner.