Abstract: The present invention relates to a web-fed laminator device (100) for producing a paperboard (203). The web-fed laminator device (100) comprises a gluing unit (101) for depositing an adhesive onto a surface of a corrugated cardboard section of a corrugated cardboard web (201) and/or a cover sheet (202), a laminating unit (102) for laminating the corrugated cardboard section with the cover sheet (202) and a common supporting structure (103). The gluing unit (101) and the laminating unit (102) are preassembled to the common supporting structure (103) in such a way that the gluing unit (101) and the laminating unit (102) are adjusted with respect to each other such that the corrugated cardboard web (201) is feedable from the gluing unit (101) to the laminating unit (102).
WEB-FED LAMINATOR DEVICE AND METHOD FOR ASSEMBLY THEREOF

Field of invention

The present invention relates to a web-fed laminator device for producing a paperboard and to a method of assembling a web-fed laminator device for producing a paperboard.

Art Background

Nowadays paperboards are a favourite material in the packaging industry. Common paperboards form a robust but also formable packaging. Furthermore, the paperboards are suitable for imprinting product description and promotion symbols.

Conventional paperboards have a core section made of corrugated cardboard sections which are laminated by cover sheets. The corrugated cardboard sections provide the structural stability and the cover sheets are printed with a desired design. A paperboard is produced by a laminator device. The corrugated cardboard section and the cover sheets are fed separately to a laminator unit of the laminator device. The laminator unit fixes the cover sheets onto the corrugated cardboard sections for example by an adhesive bond.

Summary of the Invention

According to a first aspect of the present invention a web-fed laminator device for producing a paperboard is presented. The web-fed laminator device comprises a gluing unit for depositing an adhesive onto a surface of a corrugated cardboard section of a corrugated cardboard web (e.g. normally wound up on a roll), a laminating unit for laminating the corrugated cardboard section with a cover sheet, and a common supporting structure. The gluing unit and the laminating unit are preassembled to the common supporting
structure in such a way that the gluing unit and the lamination unit are
adjusted with respect to each other such that the corrugated cardboard web is
feedable from the gluing unit to the lamination unit.

According to a further aspect of the present invention, a method of assembling
a web-fed lamination device for producing a paperboard is presented.
According to the method a gluing unit for depositing an adhesive onto a
surface of a corrugated cardboard section of a corrugated cardboard web, a
lamination unit for laminating the corrugated cardboard section with a cover
sheet, and a common supporting structure are provided. Furthermore,
according to the method, the gluing unit and the lamination unit are
preassembled to the common supporting structure in such a way that the
gluing unit and the lamination unit are adjusted with respect to each other
such that the corrugated cardboard web is feedable from the gluing unit to the
lamination unit.

According to a further aspect of the present invention, a method of installing a
web-fed lamination device as described above is presented, wherein the
common supporting structure of the web-fed lamination device is
installed onto a supporting surface, such as on mounting points of the floor, at
a production site, such that the web-fed lamination device is operable at the
production site without reassembling the gluing unit, the lamination unit and
the common supporting structure with respect to each other.

A paperboard describes generally a heavy-duty paper of various strengths.
The paperboard comprises one or multiple corrugated cardboard sections. The
paperboard may be made of a first cover layer/sheet and/or a second cover
layer/sheet between which one or multiple corrugated cardboard sections is
arranged. The cover sheets may define layers which enclose the one or
multiple corrugated cardboard sections.
The web-fed laminator device comprises the gluing unit and the lamination unit. The corrugated cardboard web is fed to the gluing unit. The gluing unit deposits an adhesive onto the surface of the corrugated cardboard section of the corrugated cardboard web. The corrugated cardboard web may be fed directly to the gluing unit or may be separated (i.e. pre-cut) in sections before being fed to the gluing unit. Additionally or alternatively, the cover sheet is fed to the gluing unit. The gluing unit deposits an adhesive onto a surface of the cover sheet. The cover sheet may be fed as a cover sheet web directly to the gluing unit or may be separated (i.e. pre-cut) in sections before being fed to the gluing unit.

Next, the corrugated cardboard web comprising the adhesive is fed to the lamination unit. Additionally to the corrugated cardboard web, the cover sheets are fed to the lamination unit. The lamination unit positions the cover sheet onto the corrugated cardboard section. Next, the lamination unit presses the cover sheet and the corrugated cardboard section together such that a robust adhesive bond is generated. For example, the lamination unit may comprise a press drum for pressing the cover sheet onto the corrugated cardboard section.

By the approach of the present invention (e.g. structurally separated) functional units, specifically the gluing unit and the lamination unit, of the web-fed laminator are preassembled to one common supporting structure. The common supporting structure defines a force transmitting structure, which transfers forces from the gluing unit and the lamination unit. Hence, the gluing unit, the lamination unit and the common supporting structure form a stiff and rigid formation and one common entity. The common supporting structure may form an integral and/or monolithically uniform structure.

Hence, the preassembled structural entity consisting of the gluing unit, the lamination unit and the common support structure may be transported from
an assembling site, to the location of production, where the web-fed laminator is supposed to be in operation for producing the paperboards.

In this context, the term "preassembled" underlines that the functional units of the web-fed laminator, such as gluing unit and the lamination unit, are fixed to the common supporting structure at the assembling site and need not be reassembled at the production site. This is in contrast to conventional approaches, where the functional units are assembled at the assembly site for testing prior to being disassembled prior to being shipped to the production site where they are reassembled for production use. According to the approach of the present invention the web-fed laminator may be preassembled, adjusted and also tested at the assembling site and then transported in its assembled state, because all functional units are really fixed to one common supporting structure. Thus, at the production site the steps of assembly, adjustment and testing may be largely or wholly avoided, with corresponding significant savings both in terms of installation time, lost productivity and consumables used for testing and set up. Specifically, the web-fed laminator device comprises a controller unit having a controller software and/or firmware installed. After the preassembling and adjusting the functional units and the common supporting structure, test cycles at the assembling site may be conducted and fine-tuning of the production process may be conducted. Based on the conducted test, the controller software may be updated. In this process positional offsets of one functional unit relative to another may be determined and where required compensated for (for example in the software and/or firmware of the control unit and/or by physical adjustment of one functional unit relative to another). This allows the laminator to carry out laminating processes with the positional precision of a correctly set up lamination machine. After testing the web-fed laminator, the functional units mounted onto the common supporting structure may be transported in one entity to the location of production of the paperboards. In other words, the web-fed laminator according to the present invention is transported in substantially a
"ready to use" state. At the location of production of the paperboards, time-consuming assembling steps and testing cycles may be avoided, so that the overall installation time at the location of production is reduced. At the production site, common supporting structure may be simply installed onto a floor (e.g. to mounting points at the floor) and the production of paperboard may be started with no or greatly reduced test cycles and adjustment steps.

According to an exemplary embodiment of the present invention, the common supporting structure comprises a ground (i.e. lower) support frame with at least one mounting bar to which the gluing unit and the lamination unit are preassembled one after another along a length direction of the mounting bar.

The ground support frame defines a frame which is generally used to be laid on and installed directly or on mounting points onto a ground floor. The ground support frame in use of the web-fed laminator device extends generally within a horizontal plane parallel to the ground floor onto which the web-fed laminator is supposed to be installed.

The mounting bar may be made of a material with a high stability, such as iron or steel. The mounting bar may be formed with a hollow profile and/or a U-profile. For example, the mounting bar may form a double-T or an I-section beam.

According to a further exemplary embodiment of the present invention, the gluing unit and the lamination unit are adjustable with respect to each other along the length direction of the mounting bar. In particular, the mounting bar may function as a guiding rail for the functional units. For example, the functional units may slide, for example by a sliding contact or by transport wheels mounted onto the functional units, along the length direction of the mounting bar until the desired installation location is reached.
According to a further exemplary embodiment, the mounting bar comprises a plurality of assembling holes which are spaced apart with respect to each other along the length of the mounting bar. The gluing unit and the lamination unit are preassembled to the mounting bar by respective fixing elements, in particular bolts and screws, which are fixable in the respective assembling holes. In particular, at the desired installation location, the functional units are fixed by the fixing elements, such as screws or bolts, to the holes of the mounting bar. By arranging the functional units along the length direction of the mounting bar, the relative position between two adjacent functional units, such as the gluing unit and the lamination unit, may be adjusted.

According to a further exemplary embodiment, the web-fed laminator device further comprises a top supporting frame (e.g. a transportation frame) with at least one further mounting bar to which the gluing unit and the lamination unit are preassembled (e.g. directly or via the common supporting structure) one after another along a further length direction of the further mounting bar.

According to a further exemplary embodiment, the ground support frame comprises at least one connecting bar which is coupled to the top supporting structure.

The top supporting frame defines a frame which is generally used to be arranged on top (i.e. above) of the functional units, such as the lamination unit and/or the gluing unit. The top supporting frame extends generally within a horizontal plane parallel to the ground floor onto which the web-fed laminator is supposed to be installed. The functional units are preassembled (i.e. fixable) to the top supporting frame.

The top supporting frame may further comprise attachment elements (such as rigid bars or flexible chains) which extend from the top supporting frame to the respective functional units or to the common supporting structure (i.e. to
the connecting bar), so that the respective functional units or the common supporting structure are fixable to the top supporting frame. The top supporting frame may be used as a transportation frame. Hence, transportation devices, such as cranes, may lift the transportation frame transporting the web-fed laminator.

The top supporting frame may be detachably fixed to the functional units and/or the common supporting structure. Hence, only for transportation the top supporting frame may be attached. In operation of the web-fed laminator device, the top supporting frame may be detached.

The attachment element may be orientated perpendicular and extend e.g. vertically with respect to the ground support frame and/or the top supporting frame.

The further mounting bar and/or the connecting bar may be made of a material with a high stability, such as iron or steel. The mounting bar may be formed with a hollow profile and/or a U-profile. For example, the mounting bar may form a double-T or an I-section beam.

The further mounting bar may also comprise a plurality of further assembling holes which are spaced apart with respect to each other along the further length of the mounting bar.

According to a further exemplary embodiment of the present invention, the ground support frame comprises a further mounting bar to which the gluing unit and the laminating unit are preassembled. The mounting bar and the further mounting bar are arranged parallel and spaced apart with respect to each other. The further mounting bar may be designed similar to the mounting bar described above. For example, the further mounting bar may comprise spaced apart assembling holes for fixing the respective functional units.
According to a further exemplary embodiment of the present invention, the common supporting structure comprises at least a transport element, in particular lifting eyes or transport hooks, wherein the transport element is formed for being engaged by a transport device, such as a crane, for transporting the common supporting structure. Hence, the common supporting structure may be transported in one entity by lifting the common support structure e.g. by a crane hook which is fixed to the transport element.

Furthermore, the at least a transport element may be a roller device, such as a roll or a wheel, which may be arranged below the ground support frame such as the mounting bar, for example, such that the web-fed-laminator may roll along the ground. Furthermore, the common supporting structure may be also lifted by a forklift pilier, for example.

According to a further exemplary embodiment, the web-fed laminator device comprises as a further functional unit a lateral cutting unit for cutting the corrugated cardboard web in the corrugated cardboard sections. The lateral cutting unit is preassembled to the common supporting structure in such a way that the lateral cutting unit and the lamination unit are adjusted with respect to each other such that the corrugated cardboard web is feedable to the lateral cutting unit and further to the lamination unit after the corrugated cardboard web is cut in corrugated cardboard section by the lateral cutting unit. Due to the prior adjustment step the feeding of the corrugated cardboard web may be achieved with the accuracy required of a production machine.

The corrugated cardboard web runs along a conveying direction through the web-fed laminator. The lateral cutting unit cuts the corrugated cardboard web along a lateral direction with respect to the conveying direction, wherein the lateral direction is orthogonal with respect to the conveying direction. After cutting the corrugated cardboard web, the respective cut cardboard section is formed onto which the cover sheet is fixed within the lamination unit.
According to a further exemplary embodiment, the web-fed laminator device comprises as a further functional unit such as a conveyor unit for conveying the cover sheets to the lamination unit. The conveyor unit is preassembled to the common supporting structure in such a way that the conveyor unit and the lamination unit are adjusted with respect to each other such that the cover sheets are conveyable to the lamination unit. The conveyor unit may comprise for example a webs conveyor and/or a role conveyor. Due to the prior adjustment step the cover sheets may be conveyable to the lamination unit with the accuracy required of a production machine.

According to a further exemplary embodiment, the web-fed laminator device comprises as a further functional unit such as a feeder unit for feeding the cover sheets to the conveyor unit. The feeder unit is preassembled to the common supporting structure in such a way that the feeder unit and the conveyor unit are adjusted with respect to each other such that the cover sheets are feedable to the conveyor unit. The feeder unit may comprise for example conveying rollers or suction head which are driven in sequence, so that in a desired sequence the cover sheets are arranged onto the conveyor unit. Due to the prior adjustment step the cover sheets may be feedable with the accuracy required of a production machine.

According to a further exemplary embodiment, the web-fed laminator device comprises as a further functional unit a longitudinal cutting unit for cutting edge sections of the corrugated cardboard web. The longitudinal cutting unit is preassembled to the common supporting structure in such a way that the longitudinal cutting unit and the lamination unit are adjusted with respect to each other such that the corrugated cardboard web is guidable from the longitudinal cutting unit to the lamination unit. Due to the prior adjustment step the corrugated cardboard web may be guidable with the accuracy required of a production machine.
According to a further exemplary embodiment, the web-fed laminator device comprises as a further functional unit a track control unit for controlling the track direction of the corrugated paperboard web. The track control unit is preassembled to the common supporting structure in such a way that the track control unit and the lamination unit are adjusted with respect to each other such that a conveying direction of the corrugated cardboard web is adjustable along a conveying direction from the longitudinal cutting unit to the lamination unit. The track control unit may comprise for example rollers onto which the corrugated cardboard web runs. The rollers may be adjusted along a lateral direction so that also the corrugated cardboard web, which is in frictional contact with the rollers, is adjusted along the lateral direction. Due to the prior adjustment step the conveying direction is set up with the accuracy required of a production machine.

According to a further exemplary embodiment of the method, the step of preassembling the gluing unit and the lamination unit to the common supporting structure is conducted at an assembling site. The gluing unit, the lamination unit and the common supporting structure are transported (in one common entity) to a production site after the step of preassembling the gluing unit and the lamination unit to the common supporting structure, wherein the web-fed laminator device is operatable at the production site. As described above, the functional units mounted onto the common supporting structure may be transported in one entity to the location of production of the paperboards. In other words, the web-fed laminator according to the present invention is transported in a "ready to use" state. At the location of production of the paperboards, no time-consuming assembling steps and testing cycles are necessary, so that the overall assembling time at the location of production is reduced.

It has to be noted that embodiments of the invention have been described with reference to different subject matters. In particular, some embodiments
have been described with reference to apparatus type claims whereas other embodiments have been described with reference to method type claims. However, a person skilled in the art will gather from the above and the following description that, unless other notified, in addition to any combination of features belonging to one type of subject matter also any combination between features relating to different subject matters, in particular between features of the apparatus type claims and features of the method type claims is considered as to be disclosed with this application.

10 Brief Description of the Drawings

The aspects defined above and further aspects of the present invention are apparent from the examples of embodiment to be described hereinafter and are explained with reference to the examples of embodiment. The invention will be described in more detail hereinafter with reference to examples of embodiment but to which the invention is not limited.

Fig. 1 shows a perspective view of a web-fed laminator according to an exemplary embodiment of the present invention;

Fig. 2 shows a schematic view of the web-fed laminator as shown in Fig. 1, wherein the cover sheet and the corrugated cardboard web are indicated;

Fig. 3 shows a schematic view of the web-fed laminator as shown in Fig. 1 and Fig. 2, wherein a top supporting frame is shown.

Detailed Description of Exemplary Embodiments

The illustrations in the drawings are schematic. It is noted that in different figures similar or identical elements are provided with the same reference signs.
Fig. 1 and Fig. 2 show a web-fed laminator device 100 for producing a paperboard 203 (see Fig. 2) according to an exemplary embodiment of the present invention. Specifically, in Fig. 2, the run of the corrugated cardboard web 201 and the run of the cover sheets 202 through the functional units is illustrated.

The web-fed laminator device 100 comprises as functional units a gluing unit 101 for depositing an adhesive onto a surface of a corrugated cardboard section of a corrugated cardboard web 201 (see Fig. 2) and a lamination unit 102 for laminating the corrugated cardboard section with a cover sheet 202 (see Fig. 2). Furthermore, the web-fed laminator device 100 comprises a common supporting structure 103. The gluing unit 101 and the lamination unit 102 are preassembled to the common supporting structure 103 in such a way that the gluing unit 101 and the lamination unit 102 are adjusted with respect to each other such that the corrugated cardboard web 201 is feedable from the gluing unit 101 to the lamination unit 102.

The corrugated cardboard web 201 is fed to the gluing unit 101. The gluing unit 101 deposits an adhesive onto the surface of the corrugated cardboard section of the corrugated cardboard web 201. Next, the corrugated cardboard web 201 comprising the adhesive is fed to the lamination unit 102. Additionally to the corrugated cardboard web 201, the cover sheets 202 are fed to the lamination unit 102. The lamination unit 102 positions the cover sheet 202 onto the corrugated cardboard section. Next, the lamination unit 102 presses the cover sheet 202 and the corrugated cardboard section together such that a robust adhesive bond is generated. For example, the lamination unit 102 may comprise a press drum for pressing the cover sheet 202 onto the corrugated cardboard section.
The functional units, and specifically the gluing unit 101 and the lamination unit 102, of the web-fed laminator device 100 are preassembled to one common supporting structure 103. The common supporting structure 103 defines a force transmitting structure, which transfers forces from the gluing unit 101 and the lamination unit 102. Hence, the gluing unit 101, the lamination unit 102 and the common supporting structure 102 forms a stiff and rigid formation and one common entity. As shown in Fig. 1 and as described below, more than the above described functional units may be attached and preassembled to the common supporting structure 103.

Hence, the structural entity consisting of the gluing unit 101, the lamination unit 102 and the common support structure 103 may be transported from an assembling site, there the functional units are preassembled to the common supporting structure, to the location of production, where the web-fed laminator 100 is supposed to be in operation for producing the paperboards 203.

The web-fed laminator device 100 comprises a controller unit 116 having a controller software installed. After the preassembling and adjusting the functional units to the common supporting structure 103, test cycles at the assembling site may be conducted and fine-tuning of the production process may be conducted. Based on the conducted test, the controller software is updated. After testing the web-fed laminator device 100, the functional units mounted onto the common supporting structure 103 are transported in one entity to the location of production of the paperboards. The web-fed laminator device 100 is transported in a "ready to use" state. At the production site, the common supporting structure 103 is simply installed onto a floor (e.g. to mounting points at the floor) and the production of paperboard may be started without further test cycles or adjustment steps.
As shown in Fig. 1, the common supporting structure 103 comprises a ground support frame 104 with at least one mounting bar 105 to which the gluing unit 101 and the lamination unit 102 (and e.g. all other shown functional devices) are preassembled one after another along a length direction 106 of the mounting bar 105. The ground support frame 104 defines a frame which is generally used to be laid on and installed onto a ground floor. The ground support frame 104 extends generally within a horizontal plane parallel to the ground floor onto which the web-fed laminator 100 is supposed to be installed. The gluing unit 101 and the lamination unit 102 are adjustable with respect to each other along the length direction of the mounting bar 105. In particular, the mounting bar 105 may function as a guiding rail for the functional units.

The ground support frame 104 comprises a further mounting bar 107 to which the gluing unit 101 and the lamination unit 102 (and e.g. all other functional units) are preassembled. The mounting bar 105 and the further mounting bar 107 are arranged parallel and spaced apart with respect to each other. The further mounting bar 107 may be designed similar to the mounting bar 105 described above. Furthermore, cross beams 108 of the ground support frame 104 may connect the mounting bar 105 and the further mounting bar 107 for reinforcing the structure of the ground support frame 104.

As shown in Fig. 1, the common supporting structure 103 comprises at least a transport element 109, in particular lifting eyes or transport hooks, wherein the transport element 109 is formed for being engaged by a transport device, such as a crane, for transporting the common supporting structure 103. Hence, the common supporting structure 103 may be transported in one entity by lifting the common support structure 103 e.g. by a crane hook which is fixed to the transport element 109.

As a further functional unit a lateral cutting unit 110 (otherwise known as a cross cutter) for cutting the corrugated cardboard web 201 in the corrugated
cardboard sections (i.e. separate sheets) is shown. The lateral cutting unit 110 is preassembled to the common supporting structure 103 in such a way that the lateral cutting unit 110 and the lamination unit 102 are adjusted with respect to each other such that the corrugated cardboard web 201 is feedable to the lateral cutting unit 110 and further to the lamination unit 102 after the corrugated cardboard web 201 is cut in corrugated cardboard section by the lateral cutting unit 110. The corrugated cardboard web 201 runs along a conveying direction 115 through the web-fed laminator 100. The lateral cutting unit 110 cuts the corrugated cardboard web 201 along a lateral direction with respect to the conveying direction 115, wherein the lateral direction is orthogonal with respect to the conveying direction 115. After cutting the corrugated cardboard web 201, the respective cut cardboard section is formed onto which the cover sheet 202 is fixed within the lamination unit 102.

As a further functional unit a conveyor unit 111 for conveying the cover sheets 202 to the lamination unit 102 is shown. The conveyor unit 111 is preassembled to the common supporting structure 103 in such a way that the conveyor unit 111 and the lamination unit 102 are adjusted with respect to each other such that the cover sheets 202 are conveyable to the lamination unit 102. The conveyor unit 111 may comprise for example a webs conveyor and/or a role conveyor. As shown in Fig. 1, the conveyor unit 111 forms a conveying bridge, wherein below the conveying bridge the functional units handling the corrugated cardboard web are installed (see in more detail in Fig. 2).

As a further functional unit a feeder unit 112 for feeding the cover sheets 202 to the conveyor unit 111 is shown. The feeder unit 112 is preassembled to the common supporting structure 103 in such a way that the feeder unit 112 and the conveyor unit 111 are adjusted with respect to each other such that the cover sheets 202 are feedable to the conveyor unit 111. The feeder unit 112
may comprise for example conveying rollers or suction head which are driven in sequence, so that in a desired sequence the cover sheets 202 are arranged onto the conveyor unit 111.

As a further functional unit a longitudinal cutting unit 113 for cutting edge sections of the corrugated cardboard web 201 is shown. The longitudinal cutting unit 113 is preassembled to the common supporting structure 103 in such a way that the longitudinal cutting unit 113 and the lamination unit 102 (and as well the gluing unit 101, for example) are adjusted with respect to each other such that the corrugated cardboard web 203 is guidable from the longitudinal cutting unit 113 to the lamination unit 102.

As a further functional unit a track control unit 114 for controlling the track direction of the corrugated paperboard web 201 is shown. The track control unit 114 is preassembled to the common supporting structure 103 in such a way that the track control unit 114 and the lamination unit 102 are adjusted with respect to each other such that a conveying direction 115 of the corrugated cardboard web 201 is adjustable along a conveying direction 115 from the longitudinal cutting unit 113 to the lamination unit 102. The track control unit 113 may comprise for example rollers onto which the corrugated cardboard web 201 runs. The rollers may be adjusted along a lateral direction so that also the corrugated cardboard web 201, which is in frictional contact with the rollers, is adjusted along the lateral direction.

Hence, at least the gluing unit 101 and the lamination unit 102 (and in particular all other above described functional units) are preassembled to the common supporting structure 103. This is conducted at an assembling site. The functional units and the common supporting structure are transported (in one common entity) to a production site after preassembling the functional units to the common supporting structure 103, wherein the web-fed laminator device 100 is operable at the production site. As described above, the
functional units mounted onto the common supporting structure 103 may be transported as one entity to the location of production of the paperboards.

**Fig. 3** shows a web-fed laminator device 100 which comprises the same features as the web-fed laminator device 100 shown in Fig. 1 and Fig. 2. Additionally, the web-fed laminator device 100 shown in Fig. 3 comprises a top supporting frame 301 (e.g. a transportation frame) with at least one further mounting bar 302 to which the gluing unit 101 and the lamination unit 102 are preassembled one after another along a further length direction of the further mounting bar 302. Furthermore, the ground support frame 301 comprises at least one connecting bar 303 which is coupled to the top supporting structure 301.

The top supporting frame 301 defines a transportation frame which is generally used to be arranged and detachably fixes on top (i.e. above) of the functional units, such as the lamination unit 102 and/or the gluing unit 101. Hence, transportation devices, such as cranes, may lift the transportation frame 301 for transporting the web-fed laminator 100.

The top supporting frame 301 extends generally within a horizontal plane parallel to the ground floor onto which the web-fed laminator is supposed to be installed. The functional units are preassembled (i.e. fixable) to the top supporting frame 301.

The top supporting frame 301 may further comprise attachment elements 304 (such as rigid bars or flexible chains) which extend from the top supporting frame 301 to the respective functional units or to the common supporting structure 103 (i.e. to the connecting bar 303), so that the respective functional units or to the common supporting structure 103 are fixable to the top supporting frame 301.
It should be noted that the term "comprising" does not exclude other elements or steps and "a" or "an" does not exclude a plurality. Also elements described in association with different embodiments may be combined. It should also be noted that reference signs in the claims should not be construed as limiting the scope of the claims.
List of reference signs:

100 Web-fed laminator
101 gluing unit
102 laminating unit
103 common supporting structure
104 ground support frame
105 mounting bar
106 length direction of mounting bar
107 further mounting bar
108 cross beam
109 transport element
110 lateral cutting unit
111 conveyor unit
112 feeder unit
113 longitudinal cutting unit
114 track control unit
115 conveying direction
116 control unit
201 corrugated cardboard web
202 cover sheet
203 paperboard

301 top supporting frame
5 302 further mounting bar
303 connecting bar
304 attachment element
CLAIMS:

1. Web-fed laminator device (100) for producing a paperboard (203), the web-fed laminator device (100) comprises
   a gluing unit (101) for depositing an adhesive onto a surface of a corrugated cardboard section of a corrugated cardboard web (201) and/or a cover sheet (202),
   a lamination unit (102) for laminating the corrugated cardboard section with the cover sheet (202),
   a common supporting structure (103),
wherein the gluing unit (101) and the lamination unit (102) are preassembled to the common supporting structure (103) in such a way that the gluing unit (101) and the lamination unit (102) are adjusted with respect to each other such that the corrugated cardboard web (201) is feedable from the gluing unit (101) to the lamination unit (102), the device further comprising a lateral cutting unit (110) preassembled to the common supporting structure (103) and arranged to cut the corrugated cardboard web (201) into corrugated cardboard sections, the device being arranged to produce laminated sections, each comprising a cover sheet laminated to a corresponding section of corrugated cardboard web (201).

2. Web-fed laminator device (100) according to claim 1, wherein the common supporting structure (103) comprises a ground support frame (104) comprising at least one mounting bar (105) to which the gluing unit (101), the lateral cutting unit (110) and the lamination unit (102) are preassembled one after another along a length direction (106) of the mounting bar (105).

3. Web-fed laminator device (100) according to claim 2,
wherein the gluing unit (101) and the lamination unit (102) are adjustable with respect to each other along the length direction (106) of the mounting bar (105).

5. Web-fed laminer device (100) according to claim 3, wherein the mounting bar (105) comprises a plurality of assembling holes which are spaced apart with respect to each other along the length of the mounting bar (105), wherein the gluing unit (101) and the lamination unit (102) are preassembled to the mounting bar (105) by respective fixing elements, in particular bolts and screws, which are fixable in the respective assembling holes.

5. Web-fed laminer device (100) according to one of the claims 2 to 4, wherein the ground support frame (104) comprises a further mounting bar (107) to which the gluing unit (101) and the lamination unit (102) are preassembled, wherein the mounting bar (105) and the further mounting bar (107) are arranged parallel and spaced apart with respect to each other.

6. Web-fed laminer device (100) according to one of the claims 1 to 5, further comprising a top supporting frame (301) with at least one further mounting bar (302) to which the gluing unit (101) and the lamination unit (102) are preassembled one after another along a further length direction of the further mounting bar (302).

7. Web-fed laminer device (100) according to claim 6, wherein the ground support frame (104) comprises at least one connecting bar (303) which is coupled to the top supporting structure (301).

8. Web-fed laminer device (100) according to one of the claims 1 to 7,
wherein the common supporting structure (103) comprises at least a transport element (109), in particular lifting eyes or transport hooks,
wherein the transport element (109) is formed for being engaged by a transport device for transporting the common supporting structure (103).

9. Web-fed laminator device (100) according to one of the claims 1 to 8, further comprising
   a conveyor unit (111) for conveying the cover sheets (202) to the laminating unit (102),
wherein the conveyor unit (111) is preassembled to the common supporting structure (103) in such a way that the conveyor unit (111) and the laminating unit (102) are adjusted with respect to each other such that the cover sheets (202) are conveyable to the laminating unit (102).

10. Web-fed laminator device (100) according to one of the claims 1 to 9, further comprising
    a feeder unit (112) for feeding the cover sheets (202) to the conveyor unit (111),
wherein the feeder unit (112) is preassembled to the common supporting structure (103) in such a way that the feeder unit (112) and the conveyor unit (111) are adjusted with respect to each other such that the cover sheets (202) are feedable to the conveyor unit (111).

11. Web-fed laminator device (100) according to one of the claims 1 to 10, further comprising
    a longitudinal cutting unit (113) for cutting edge sections of the corrugated cardboard web (201),
wherein the longitudinal cutting unit (113) is preassembled to the common supporting structure (103) in such a way that the longitudinal cutting unit (113) and the laminating unit (102) are adjusted with respect to each other
such that the corrugated cardboard web (201) is guidable from the longitudinal cutting unit (113) to the lamination unit (102).

12. Web-fed laminator device (100) according to one of the claims 1 to 11, further comprising
   a track control unit (114) for controlling the track direction of the corrugated paperboard web,
wherein the track control unit (114) is preassembled to the common supporting structure (103) in such a way that the track control unit (114) and the lamination unit (102) are adjusted with respect to each other such that a conveying direction (115) of the corrugated cardboard web (201) is adjustable along a conveying direction (115) from the longitudinal cutting unit (113) to the lamination unit (102).

13. Web-fed laminator device (100) for producing paperboard sheets (203), the web-fed laminator device (100) comprising
   a gluing unit (101) for depositing an adhesive onto a surface of a corrugated cardboard section of a corrugated cardboard web (201) and/or a cover sheet (202),
   a lamination unit (102) for laminating the corrugated cardboard section with the cover sheet (202), and
   a common supporting structure (103),
the gluing unit (101) and the lamination unit (102) being preassembled to the common supporting structure (103) in such a way that the gluing unit (101) and the lamination unit (102) are adjusted with respect to each other such that the corrugated cardboard web (201) is feedable from the gluing unit (101) to the lamination unit (102),
the common supporting structure (103) comprising a ground support frame that extends generally in a horizontal plane parallel to the floor onto which the web-fed laminator is to be installed and which is adapted to be laid on and installed directly on the floor or mounting points on the floor, the ground
support frame comprising at least one mounting bar to which the gluing unit and the lamination unit are preassembled one after another along a length direction of the mounting bar.

14. A device according to claim 13, wherein the gluing unit (101) and the lamination unit (102) are adjustable with respect to each other along the length direction (106) of the mounting bar (105).

15. A device according to claim 13 or 14, wherein the common supporting structure (103) comprises a further mounting bar (107) to which the gluing unit (101) and the lamination unit (102) are preassembled, wherein the mounting bar (105) and the further mounting bar (107) are arranged parallel and spaced apart with respect to each other.

16. A device according to claim 13 to 15, wherein the common supporting structure (103) further comprises a top supporting frame (301) comprising at least one further mounting bar (302) to which the gluing unit (101) and the lamination unit (102) are preassembled one after another along a further length direction of the further mounting bar (302).

17. A device according to any one of claims 13 or 16, wherein the common supporting structure comprises at least one connecting bar (303) which is connects the ground support frame to the top supporting frame (301).

18. A device according to any one of claims 13 or 17, wherein the common supporting structure (103) comprises at least a transport element (109), in particular lifting eyes or transport hooks, wherein the transport element (109) is formed for being engaged by a transport device for transporting the device.
19. A device according to any one of claims 15 or 18, arranged such that the top supporting frame (301) may be attached for transporting the device and detached during laminating operation of the device.

20. A device according to any one of claims 13 to 19, further comprising a one or more further functional units, such as a lateral cutting unit or a longitudinal cutting unit or a cover sheet conveyor unit or a cover sheet feeder unit or a track control unit, connected to the common supporting structure.

21. Method of assembling a web-fed laminator device (100) for producing a paperboard (203), the method comprises

- providing a gluing unit (101) for depositing an adhesive onto a surface of a corrugated cardboard section of a corrugated cardboard web (201) and/or a cover sheet (202),
- providing a lamination unit (102) for laminating the corrugated cardboard section with the cover sheet (202),
- providing a common supporting structure (103),
- preassembling the gluing unit (101) and the lamination unit (102) to the common supporting structure (103) in such a way that the gluing unit (101) and the lamination unit (102) are adjusted with respect to each other such that the corrugated cardboard web (201) is feedable from the gluing unit (101) to the lamination unit (102).

22. Method according to claim 21,

wherein the step of preassembling the gluing unit (101) and the lamination unit (102) to the common supporting structure (103) is conducted at an assembling site,

wherein the method further comprises

- transporting the gluing unit (101), the lamination unit (102) and the common supporting structure (103) to a production site after the step of
preassembling the gluing unit (101) and the lamination unit (102) to the common supporting structure (103), wherein the web-fed laminator device (100) is operable at the production site.

23. Method of installing a web-fed laminator device (100) according to one of the claims 1 to 20, wherein the common supporting structure (103) of the web-fed laminator device (100) is installed onto a supporting surface, such as on mounting points of the floor, at a production site, such that the web-fed laminator device (100) is operable at the production site without preassembling the gluing unit (101), the lamination unit (102) and the common supporting structure (103) with respect to each other.

24. Web-fed laminator device (100) for producing a paperboard (203), the web-fed laminator device (100) comprises

- a gluing unit (101) for depositing an adhesive onto a surface of a corrugated cardboard section of a corrugated cardboard web (201) and/or a cover sheet (202),
- a lateral cutting unit (110) for cutting the corrugated cardboard web (201) into sections,
- a lamination unit (102) for laminating the corrugated cardboard section with the cover sheet (202), and
- a common supporting structure (103),

wherein the gluing unit (101), the lateral cutting unit (110) and the lamination unit (102) are arranged to be assembled on the common supporting structure (103), the position of the gluing unit (101) and the lateral cutting unit (110) being adjustable on the common supporting structure (103) relative to the lamination unit (102), the device being adapted to be shipped and installed at a production site as a substantially unitary device.
25. Web-fed laminator device (100) for producing a paperboard (203), the web-fed laminator device (100) comprises
   a gluing unit (101) for depositing an adhesive onto a surface of a corrugated cardboard section of a corrugated cardboard web (201) and/or a cover sheet (202),
   a lamination unit (102) for laminating the corrugated cardboard section with the cover sheet (202),
   and
   a common supporting structure (103),
wherein the gluing unit (101) and the laminating unit (102) are preassembled to the common supporting structure (103) in such a way that the gluing unit (101) and the laminating unit (102) are adjusted with respect to each other such that the corrugated cardboard web (201) is feedable from the gluing unit (101) to the laminating unit (102).
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

INV. B31F1/20

ADD.

According to International Patent Classification (IPC) or both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B31F G06Q B66C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :
  * "A" document defining the general state of the art which is not considered to be of particular relevance
  * "E" earlier application or patent but published on or after the international filing date
  * "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citon or other special reason (as specified)
  * "O" document referring to an oral disclosure, use, exhibition or other means
  * "P" document published prior to the international filing date but later than the priority date claimed
  * "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
  * "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
  * "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
  * "Z" document member of the same patent family

Date of the actual completion of the international search

31 August 2016

Date of mailing of the international search report

08/09/2016

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040; Fax: (+31-70) 340-3016

Authorized officer

Sundqvi st, Stefan
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**INTERNATIONAL SEARCH REPORT**

### Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.: because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

> see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☑ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

   1-10, 13-19, 21-25 (completely); 20(partly)

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant’s protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant’s protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☒ No protest accompanied the payment of additional search fees.

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Form PCT/ISA/21 0 (continuation of first sheet (2)) (April 2005)
FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7, 13-17, 19, 21, 25 (completely); 20 (partially)

Web-fed laminator device with mounting bars (claims 1-7 and 13-17, 19, 20, the latter partly, as dependent on claim 25); assembly method (claim 21).

2. claims: 8, 18, 22-24

Web-fed laminator device with transport elements (claim 8 as dependent on claim 1; claim 18 as dependent on claim 13); transport of web-fed laminator device to a production site (claim 22); web-fed laminator device otherwise adapted for shipping as a unit (claim 24); installation method (claim 23).

3. claims: 9, 10 (completely); 20 (partially)

Web-fed laminator device with conveyor unit for sheets (claims 9-10 and 20, the latter partly, as dependent on claim 1).

4. claims: 11 (completely); 20 (partially)

Web-fed laminator device with edge cutter (claims 11 and 20, the latter partly, as dependent on claim 1).

5. claims: 12 (completely); 20 (partially)

Web-fed laminator device with track control unit (claims 12 and 20, the latter partly, as dependent on claim 1).