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(54) Benævnelse: **Transportindretning til et samlebånd**

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DE-A1- 3 713 431
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US-A1- 2006 191 439
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DESCRIPTION

[0001] The invention describes a conveyor apparatus for an assembly line, an assembly station, an assembly line and a method of assembling a generator for a wind turbine.

[0002] An armature and a field magnet arrangement for a generator can be assembled in various successive assembly stages. In one example of a rotor assembly procedure, various components such as a bearing and a hub interface are mounted in a first assembly step to a hollow annular rotor shaft. A form-retaining element can be temporarily mounted onto the rotor so that this maintains its circular shape during the assembly stages. An essentially perfect circular shape is mandatory, particularly considering the weight of the magnet poles. The stator can be merged with the rotor at one assembly stage, for example by connecting the stator shaft to the previously mounted bearing. In this step, extreme care must be taken to maintain a constant air gap between the rotor and the stator. In a subsequent assembly step, cabling can be installed and connected. In another step, the magnets can be mounted onto the rotor. In a final stage, a brake disc is mounted onto the rotor. This assembled part of the generator can then be transferred to a next assembly area for incorporating into a nacelle.

[0003] A conventional wind turbine generally comprises a gearbox to increase the rotational speed of its generator relative to its rotor shaft and therefore to increase the pole change frequency. A gearbox comprises many components that are subject to wear and must be maintained or replaced at intervals. Complex and expensive bearing arrangements are also required to bear the extreme loads and torque acting on the rotor shaft and the gearbox. A direct-drive wind turbine has several advantages over such a conventional wind turbine, whereby a major advantage is that a direct-drive turbine does not require such a gearbox. A direct-drive wind turbine therefore requires fewer parts, is less complex, and more reliable. For these reasons, demand for direct drive wind turbines is increasing.

[0004] A direct-drive generator has a relatively large diameter and many magnets of altering polarity arranged along a circumference of a field magnet arrangement - usually an outside rotor - to allow for a sufficiently high pole-change frequency. The physical dimensions and weight of such a large generator pose problems during its assembly. Handling of the heavy, unwieldy and vulnerable components is complex and time-consuming, and is also hazardous, so that strict safety measures must be adhered to. This adds considerably to the overall time and cost required for the assembly of a direct-drive generator. In prior art assembly methods, a generator can be assembled essentially in one location, i.e. any parts or tools needed for the assembly are brought to that location, and then removed to another location when no longer needed. Alternatively, a partially assembled rotor or generator can be moved from one assembly area to another using equipment that is capable of carrying the heavy loads, for example cranes or other hoisting apparatus. Since several generators might be assembled simultaneously, the known methods involve much transport and moving of partially assembled generator components, tools and parts, and the risk of damage to a sensitive precision component such as a stator or a rotor is very high. For these reasons, the known methods are costly and time-consuming. A conveyor apparatus comprising assembly stations, a guide, engaging means and driving means is known for example from US 6,494,304 B1 and US 2006/0191439 A1.

[0005] It is therefore an object of the invention to provide a more efficient and economical way of assembling a generator, particularly a generator for a direct-drive wind turbine.

[0006] This object is achieved by the conveyor apparatus of claim 1 for an assembly line; by the assembly station of claim 10; by the assembly line of claim 12; and by the method of claim 14 of assembling a generator for a wind turbine.

[0007] According to the invention, the conveyor apparatus is for an assembly line comprising a plurality of assembly stations, wherein an assembly station is independently moveable when decoupled from the conveyor apparatus and comprises a frame support realized to bear a rotor of a wind turbine generator as the rotor is being assembled. The conveyor apparatus according to the invention comprises a guide realised to define a path of travel for an assembly station ; an engaging means for engaging an assembly station to a conveyer band arranged about the guide; and a driving means comprising the conveyer band, a number of hooks connected at intervals to the conveyor band, wherein each hook is realized to engage with an engaging means, and a motor realized to actuate the conveyor band to drive the engaging means along the guide such that the assembly station is moved through successive stages of an assembly line.

[0008] An advantage of the conveyor apparatus of the invention is that assembly steps can be carried out for a machine (i.e. a machine being assembled) at a single assembly station from an initial assembly step to a final assembly step, without having to move or transfer the unfinished machine from one assembly station to another. The conveyor apparatus according to the invention favourably requires less handling of an unfinished machine, thereby also reducing the risk of damage. Furthermore, the conveyor apparatus according to the invention allows a very economic and efficient distribution of tools or devices, since the tools

or devices needed for a specific assembly stage need only be supplied at the corresponding stage of the assembly line. Also, since a final assembly step can be performed at a final stage of the assembly line, a finished machine can always be presented ready for collection at the same location, thereby increasing the efficiency of transport and reducing the likelihood of accidents or errors.
According to the invention, the assembly station for use in an assembly line comprises a frame support realised to bear a rotor of a wind turbine generator as the rotor is being assembled; an engaging means coupling part realised to couple the assembly station to an engaging means of a conveyor apparatus according to the invention; and an assembly station driving means realised to allow the assembly station to travel alongside the guide of the conveyor apparatus, wherein the assembly station is independently moveable when decoupled from the conveyor apparatus.

[0009] According to the invention, the assembly line comprises a plurality of independently moveable assembly stations, wherein an assembly station comprises a frame support realised to bear a rotor of a wind turbine generator as the rotor is being assembled; and a conveyor apparatus according to the invention for conveying an assembly station from an initial stage of the assembly line to a final stage of the assembly line.

[0010] According to the invention, the method of assembling a generator for a wind turbine comprises the steps of assembling a generator component at successive stages of an assembly line according to the invention, whereby the first generator component is mounted and assembled on a specific assembly station, wherein an assembly station comprises a frame support realised to bear the first generator component of a wind turbine generator as the first generator component is being assembled; driving the conveyor apparatus to convey the assembly station along the assembly line through successive stages of the assembly line; and merging a second generator component with the first generator component at a specific stage of the assembly line.

[0011] Particularly advantageous embodiments and features of the invention are given by the dependent claims, as revealed in the following description. Features of different claim categories may be combined as appropriate to give further embodiments not described herein.

[0012] In the following, without restricting the invention in any way, it may be assumed that the machine being assembled on the assembly line is a generator for a wind turbine. Furthermore, it may be assumed that the first component mounted on an assembly station moved along the conveyor apparatus is a rotor, for example an outside rotor of a direct drive generator. Similarly, it maybe assumed that the second component comprises a stator. Furthermore, it may also be assumed that the conveyor apparatus is realised to move an assembly station horizontally.

[0013] An assembly station may be understood to be a frame support realised to bear the rotor as this is being assembled. Since the assembly station can be moved along the ground, it may be referred to as a "transport frame" in the following. Preferably, the transport frame is constructed such that the rotor is held horizontally, i.e. the rotation axis, about which the moving part of the generator will rotate during operation, is arranged essentially horizontally, or parallel to a level floor surface. Preferably, an assembly station comprises wheels or rollers so that it can travel along the ground and can be independently moveable when decoupled from the conveyor apparatus.

[0014] Preferably, the assembly line comprises as many assembly stations as there are assembly stages or steps. In other words, if the assembly of a rotor requires ten assembly stages, the assembly line preferably also comprises ten assembly stations, and the conveyor apparatus is realised to be long enough to accommodate the ten assembly stations. In this way, a specific assembly step can always be performed at the same assembly station. Once that assembly step has been completed for a first partially assembled rotor, that assembly station is moved by the conveyor apparatus further down the assembly line, and the next assembly station takes its place, so that this specific assembly step can be carried out on the next partially assembled rotor, and so on.

[0015] The driving means can be incorporated in the engaging means, for example an engaging means can comprise its own motor realised to move the engaging means along the guide. However, since the combined weight of an assembly station and the machine being assembled can be very heavy, such a motor would have to be correspondingly large and powerful. Therefore, in a particularly preferred embodiment of the invention, the driving means comprises a conveyor band such as a belt or cable, arranged between an initial stage of the assembly line and a final stage of the assembly line. Here, the terms "initial stage" and "final stage" refer to the stages through which an assembly station can be moved by the conveyor apparatus according to the invention. Of course, an assembly line can comprise other stages in addition to these. Preferably, the conveyor band is realised as endless loop that can travel along the guide. The endless loop can comprise a suitably strong cable such as a spliced steel cable. As indicated above, to move the conveyor band, the driving means comprises a suitable motor realised to actuate the conveyor band. The driving means is therefore similar to a cable-car arrangement.

[0016] The guide itself is preferably shaped to allow the engaging means to travel evenly and securely. For example, the guide can comprise a steel beam or bar with a T-shaped cross-section such that the stem of the T is arranged vertically, and the bar of the T is arranged horizontally. In one embodiment, the engaging means can simply be shaped to fit about the bar of the T. To ensure a low-friction motion of the engaging means along the guide or guiding beam, this can be lubricated. However, in a preferred embodiment of the invention, the engaging means can comprise a number of freely rotatable rollers that roll along the guide as the conveyor band is actuated. For example, the engaging means can comprise at least one roller on each side of the stem of the guide, such that the rollers roll along the vertical surfaces of the guide,

[0017] The engaging means can be realised in any suitable manner for engaging an assembly station to the guide, for example the engaging means might be realised to be fastened using fasteners to a conveyor band. At an initial stage of the assembly line, the engaging means for an assembly station would therefore be connected to the conveyor band, and disconnected again once the assembly station has reached the final stage of the assembly line. The connection and disconnection steps might require some time to perform. Therefore, in a further preferred embodiment of the invention, the driving means comprises a hook connected to the conveyor band, which hook is realised to engage with the engaging means without the need for fasteners. Since the hook can simply engage with the engagement means, an assembly station can simply "hook into" the conveyor apparatus at the initial stage of the assembly line, and can simply "hook out" of the conveyor apparatus at the final stage of the assembly line. This embodiment can therefore be even more economical. Such an arrangement, with a hook, a cable and a guide rail, has the advantage that it is very compact and can be fitted so as not to interfere with work that must be carried out along the assembly line. Such a conveyor system can be realised at a favourably low cost.

[0018] To ensure that the hook and the engaging means do not inadvertently disengage as an assembly station is being moved along the assembly line, in a preferred embodiment of the invention the engaging means comprises a hook coupling part for coupling the engaging means to the hook.

[0019] Once an assembly station has reached the final stage of the assembly line, the hook could be removed from the conveyor apparatus at that final stage and carried back to the initial stage where it can be connected once again to the conveyor band. However, in a further preferred embodiment of the invention, the conveyor apparatus is realised to return the hook from a final stage of the assembly line to an initial stage of the assembly line. The "return" can be effected automatically, for example in a two-cable realisation of the conveyor apparatus in which the hook can be decoupled from the first cable and transported back to the beginning or initial stage of the assembly line along the second cable. Alternatively, the conveyor apparatus can comprise a conveyor chain with a number of dogs that can pull the assembly stations on the one side, and can return the pulling chain wheel on the other side. Pins or other engaging means coupling parts of the assembly station can engage with the dogs, the chain can then be pulled forward in the direction of the final stage of the assembly line to move each assembly station to the next stage, whereupon the chain can be given some slack to release tension.

[0020] Preferably, to ensure that the engaging means does not inadvertently disengage from the assembly station, and to ensure that the assembly station is securely "anchored" on the engaging means, the engaging means preferably comprises an assembly station coupling part for coupling the engaging means to the assembly station. For example, the assembly station might comprise a rod or bar that is shaped to fit into a corresponding opening or cavity of the engaging means.

[0021] As indicated above, an assembly line can comprise several assembly stations. These preferably all move synchronously along the conveyor apparatus. To this end, a "leading" assembly station could be connected to a following assembly station by means of a tow rope, and the remaining assembly stations could also be interconnected in this manner to form a linked line. In such a realisation, only the "lead" assembly station would need to be pulled by the conveyor apparatus, and all subsequent assembly stations are compelled to follow. However, this would require that, when the final assembly stage is completed for the "lead" assembly station, this leaves the assembly line, and the following assembly station would have to be connected to the engaging means. Furthermore, the engaging means would have to be dimensioned according to the weight of the assembly stations. Therefore, in a particularly preferred embodiment of the invention, the conveyor apparatus preferably comprises at least one engaging means for each assembly station of a plurality of assembly stations of the assembly line. In this embodiment, the assembly stations are spaced apart according to the distances between the engaging means of the conveyor apparatus, and the assembly stations need not be interconnected but can be independent from each other.

[0022] When the driving means actuates the conveyor band, the engaging means are all displaced synchronously in the same direction, so that all the assembly stations are compelled to move synchronously in the same direction also.

[0023] The various stages of assembly are carried out at assembly stages of the assembly line. Such an assembly line can comprise dedicated areas or specific assembly stages, whereby an assembly stage takes place within the region bounded by a

dedicated area. To allow for a particularly straightforward progression along the assembly line, these dedicated areas are preferably spaced apart by equal distances. Therefore, in a further preferred embodiment of the invention, the driving means is realised to displace an engaging means by a predefined distance along the guide. For example, once each assembly stage has been completed for the assembly stages, the driving means can be actuated to move the conveyor band and therefore also the engaging means, so that the assembly stations are synchronously displaced. For example, once the assembly station at the final stage has been removed from the assembly line, a service technician can issue a signal to a controller of the driving means to cause the remaining assembly stations to move along the assembly line. A "new" assembly station can then be hooked into the conveyor apparatus at the initial stage of the assembly line. In this way, all stages of the assembly line can be occupied at any one time for a very efficient assembly process.

[0024] An assembly station or transport frame is preferably realised as a steel framework with outliers to which rollers or wheels are attached so that the transport frame can be moved about. Preferably, a transport frame comprises at least two engaging means coupling parts for coupling with two corresponding engaging means of the conveyor apparatus. For example, an outlier arranged to travel alongside the guide can be equipped with two such coupling parts, so that the transport frame cannot assume a skewed orientation relative to the guide. Preferably, only one type of assembly station is used in the assembly line i.e. the dimensions of the transport frames are all essentially equal, so that each transport frame occupies essentially the same area or space along the assembly line.

[0025] The conveyor apparatus can be arranged at ground level in an assembly hall or factory. Such an arrangement can facilitate any maintenance work that may need to be carried out. However, in a particularly preferred embodiment of the invention, the conveyor apparatus is arranged at least partially below a floor level of the assembly line. In this way, the mechanism of the conveyor apparatus is protected from damage, and the conveyor apparatus itself is less intrusive. For example, part of a steel guide can be anchored in a concrete floor, and part of the driving means could also be arranged below ground level. For example, a "return path" for a hook and conveyor cable could be arranged below ground level.

[0026] The conveyor apparatus and the assembly stations could be realised such that the assembly line assumes a circular shape. For example, a circular guide rail could transport assembly stations in a carousel arrangement. The assembly stations can be realised to have a chassis shape based on a radial section of such a circle, and can be arranged either "inside" or "outside" the circular guide rail. The initial and final stages of such a circular assembly line can be defined in an ad hoc manner as required. In a preferred embodiment of the invention, the assembly line comprises a linear arrangement of assembly stations, since an assembly station with an essentially square or rectangular chassis may provide a more optimal support for the heavy components being transported.

[0027] Other objects and features of the present invention will become apparent from the following detailed descriptions considered in conjunction with the accompanying drawings. It is to be understood, however, that the drawings are designed solely for the purposes of illustration and not as a definition of the limits of the invention.

Fig. 1 shows a schematic plan view of an assembly line according to the invention at a first time instant;

Fig. 2 shows a schematic representation of a conveyor apparatus according to an embodiment of the invention and a detail of an assembly frame according to an embodiment of the invention;

Fig. 3 shows a schematic plan view of the assembly line of Fig. 1 at a second time instant.

[0028] In the diagrams, like numbers refer to like objects throughout. Objects in the diagrams are not necessarily drawn to scale.

[0029] Fig. 1 shows a schematic plan view of an assembly line 1 according to the invention at a first time instant. The assembly line 1 is used to assemble a component 4 for a wind turbine, more specifically to assemble a generator 4 for a direct drive wind turbine. The assembly line 1 comprises six distinct assembly stages 1A, ..., 1F. At each assembly stage 1A, ..., 1F a rotor transport frame 3 is positioned. A conveyor apparatus according to the invention is used to convey a rotor transport frame 3 from one assembly stage 1A, ..., 1E to the next 1B, ..., 1F. Each stage 1A, ..., 1F can be dedicated to a specific assembly step, as outlined in the introduction. For example, at the second assembly stage 1B shown here, a stator 41 can be merged with a partially assembled rotor 40. The stator 41 can be transported to the assembly line 1 using a stator transport frame 5. In the fourth assembly stage 1D shown here, the rotor 40 can be equipped with a plurality of permanent magnets with the aid of a magnet assembly station 6. Of course, these assembly stages 1A, ..., 1F are only exemplary.

[0030] The conveyor apparatus comprises a conveyor loop 22, for example a spliced steel cable 22 that is driven by a motor 23

such that the cable 22 travels about a guide rail 20 in an endless loop. Each rotor transport frame 3 is engaged to the cable 22 by means of an engaging means. In this embodiment, each rotor transport frame 3 comprises two coupling means 311 for coupling it to the conveyor loop cable 22.

[0031] The assembly line 1 can occupy a certain region of a factory floor, as indicated by the boundary around the assembly line. A stator assembly area 10 can occupy another region of the factory floor, while, for example, a generator testing station 11 can occupy a further region of the factory floor.

[0032] Fig. 2 shows a schematic representation of a conveyor apparatus according to an embodiment of the invention and a detail of an assembly frame 3 according to an embodiment of the invention.

[0033] The guide rail 20 of the conveyor apparatus comprises a rigid steel bar with a T-shaped cross-section, and is partially embedded in a foundation below floor level, so that only the bar of the T and a portion of the stem of the T are exposed above floor level. The conveyor apparatus comprises a spliced steel cable 22 arranged as an endless loop 22 about the guide rail 20. Hooks 24 are connected at intervals to the cable 22, and each hook 24 is realised to mate with a mover 21 or engaging means 21. The engaging means 21 comprises a number of rollers 25 arranged to roll along a vertical surface of the stem of the guide rail 20 or along the cable 22, so that the assembly station 3 can proceed smoothly along the assembly line.

[0034] The assembly frame 3 comprises two coupling parts 311 for coupling with coupling means 211 of two corresponding engaging means 21 or movers 21 that are pulled by the hooks 24 connected to the conveyor cable 22.

[0035] Once the assembly station 3 has reached the final stage 1F of the assembly line 1, the assembly station 3 can be decoupled from the hook 24 and conveyor cable 22. The hook 24 can be returned automatically along a return path of the cable 22 to the initial assembly stage 1A, while the assembly station 3 can be propelled manually across the factory floor to the initial stage 1A of the assembly line 1. The mover 21 can be transported with the assembly station 3 or separately.

[0036] Fig. 3 shows a schematic plan view of the assembly line 1 of Fig. 1 at a second time instant. Here, the assembled generator 4 of Fig. 1 has been removed from the last assembly station 3', and this assembly station 3' has been decoupled from the conveyor apparatus. The motor 23 of the conveyor apparatus has been controlled to actuate the conveyor loop 22 such that the remaining assembly stations 3 are moved forward by the same distance d, from the assembly stations 1A - 1E and into the assembly stations 1B - 1F. The empty assembly station 3' is now being moved back to the initial assembly stage 1A, where it can be coupled to the conveyor loop 22 and can be used to commence assembly of a further rotor 41. For example, a suitable moving apparatus can be moved under the empty assembly station 3' to transport this back to the initial stage of the assembly line.

[0037] Although the present invention has been disclosed in the form of preferred embodiments and variations thereon, it will be understood that numerous additional modifications and variations could be made thereto without departing from the scope of the invention. For example, although the assembly frame described herein is described as holding the rotor with its rotation axis in a horizontal position, the assembly frame and the assembly line could equally well be designed for an assembly technique in which the rotor is held with its rotation axis in a vertical position.

[0038] For the sake of clarity, it is to be understood that the use of "a" or "an" throughout this application does not exclude a plurality, and "comprising" does not exclude other steps or elements.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US6494304B1 **[0004]**
- US20060191439A1 **[0004]**

Patentkrav

1. Transportindretning til et samlebånd (1), omfattende et antal samlestationer (3), hvor en samlestation (3) kan bevæges uafhængigt, når den frakobles fra transportindretningen, og omfatter en rammeunderstøtning, der er udformet til at bære en rotor (40) af en vindmøllegenerator, mens rotoren (40) samles, hvilken transportindretning omfatter

- en føring (20), der er udformet til at definere en bevægelsesbane for en samlestation (3);
- et indgrebsmiddel (21) til at bringe en samlestation (3) i indgreb med et transportbånd (22), der er placeret omkring føringen (20); og
- et drivmiddel (22, 23, 24), der omfatter transportbåndet (22), et antal kroge (24), der er forbundet med transportbåndet (22) i intervaller, hvor hver krog (24) er udformet til at gå i indgreb med et indgrebsmiddel (21), og en motor (23), der er udformet til at aktivere transportbåndet (22) til at drive indgrebsmidlet (21) langs føringsskinnen (20), således at samlestationen (3) bevæges gennem efter hinanden følgende trin (1A, ..., 1F) af samlebåndet (1).

2. Transportindretning ifølge krav 1, hvor drivmidlet (22, 23, 24) omfatter et transportbånd (22), der er anbragt mellem et indledende trin (1A) af samlebåndet (1) og et afsluttende (1F) trin af samlebåndet (1).

3. Transportindretning ifølge krav 1 eller 2, hvor transportbåndet (22) omfatter et splejset stålkabel og er udformet til at bevæge sig omkring føringen (20) i en endeløs løkke.

4. Transportindretning ifølge et hvilket som helst af de foregående krav, hvor føringen (20) omfatter en stålbom med et T-formet tværsnit, og hvor et indgrebsmiddel (21) er formet til at passe omkring bjælken af T'et.

5. Transportindretning ifølge et hvilket som helst af de foregående krav, hvor indgrebsmidlet (21) omfatter en krogkoblingsdel (210) til sammenkobling af indgrebsmidlet (21) og krogen (24).

6. Transportindretning ifølge et hvilket som helst af de foregående krav, hvor transportindretningen er udformet til at returnere krogen (24) fra et afslutten-

de trin (1F) af samlebåndet (1) til et indledende trin (1A) af samlebåndet (1).

7. Transportindretning ifølge et hvilket som helst af de foregående krav, hvor indgrebsmidlet (21) omfatter en samlestationkoblingsdel (211) til sammenkobling af indgrebsmidlet (21) og samlestationen (3).

8. Transportindretning ifølge et hvilket som helst af de foregående krav, omfattende mindst et indgrebsmiddel (21) for hver af flerheden af samlestationer (3, 3') af samlebåndet (1).

9. Transportindretning ifølge et hvilket som helst af de foregående krav, hvor drivmidlet (22, 23, 24) er udformet til at forskyde et indgrebsmiddel (21) med en forudbestemt afstand (d) langs føringen (20).

10. Samlestation (3, 3') til anvendelse i et samlebånd (1), hvilken samlestation (3, 3') omfatter
- en rammeunderstøtning, der er udformet til at bære en rotor (40) af en vindmøllegenerator, mens rotoren (40) samles;
- en indgrebsmiddelkoblingsdel (311), der er udformet til at sammenkoble samlestation (3, 3') med et indgrebsmiddel (21) af en transportindretning ifølge et hvilket som helst af kravene 1 til 9; og
- et samlestationdrivmiddel (22, 23, 24), der er udformet til at gøre det muligt for samlestationen (3, 3') at bevæge sig langs transportindretningens føring (20); og hvor samlestationen (3, 3') kan bevæges uafhængigt, når den frakobles fra transportindretningen.

11. Samlestation ifølge krav 10, omfattende mindst to indgrebsmiddelkoblingsdele (311) til sammenkobling med to tilsvarende indgrebsmidler (21) af transportindretningen.

12. Samlebånd (1) omfattende
- en flerhed af uafhængigt bevægelige samlestationer (3), hvor en samlestation (3) omfatter en rammeunderstøtning, der er udformet til at bære en rotor (40) af en vindmøllegenerator, mens rotoren (40) samles;

- transportindretning ifølge et hvilket som helst af kravene 1 til 9 til transport af en samlestation (3) fra et indledende trin (1A) af samlebåndet (1) til et afsluttende trin (1F) af samlebåndet (1).

13. Samlebånd ifølge krav 12, hvor en komponent (4) samles på en specifik samlestation (3) mellem det indledende trin (1A) og det afsluttende trin (1F) af samlebåndet (1).

14. Fremgangsmåde til samling af en generator (4) til en vindmølle, hvilken fremgangsmåde omfatter trinnene med
- at påbegynde samling af en første generatorkomponent (40) i et indledende trin (1A) af et samlebånd (1) ifølge krav 12 eller 13, hvor den første generatorkomponent (40) samles på en specifik samlestation (3), og hvor en samlestation (3) omfatter en rammeunderstøtning, der er udformet til at bære den første generatorkomponent (40) af en vindmøllegenerator, mens den første generatorkomponent (40) samles;
- at sammenføje en anden generatorkomponent (41) med den første generatorkomponent (40) i et specifikt trin (1D) af samlebåndet (1); og
- at færdiggøre samling af generatoren (4) i et afsluttende trin (1F) af samlebåndet (1).

15. Fremgangsmåde ifølge krav 14, hvilken fremgangsmåde omfatter et eller flere af trinnene med
- at fjerne generatoren (4) fra den specifikke samlestation (3);
- at frigøre den specifikke samlestation (3) fra transportindretningen;
- at drive transportindretningen til at transportere de resterende samlestationer (3) langs samlebåndet (1), således at hver samlestation (3) fortsætter til samlebåndets (1) næste trin;
- at bringe en samlestation (3) i indgreb med transportindretningen i et indledende trin (1A) af samlebåndet (1).

DRAWINGS

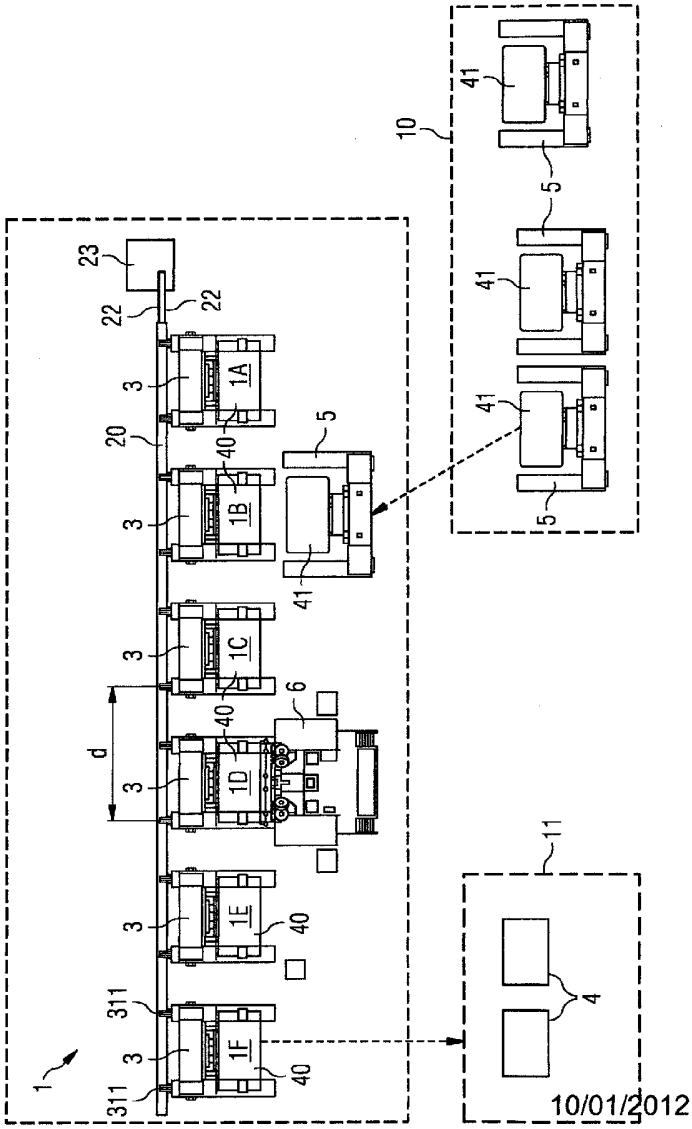

FIG 1

FIG 2

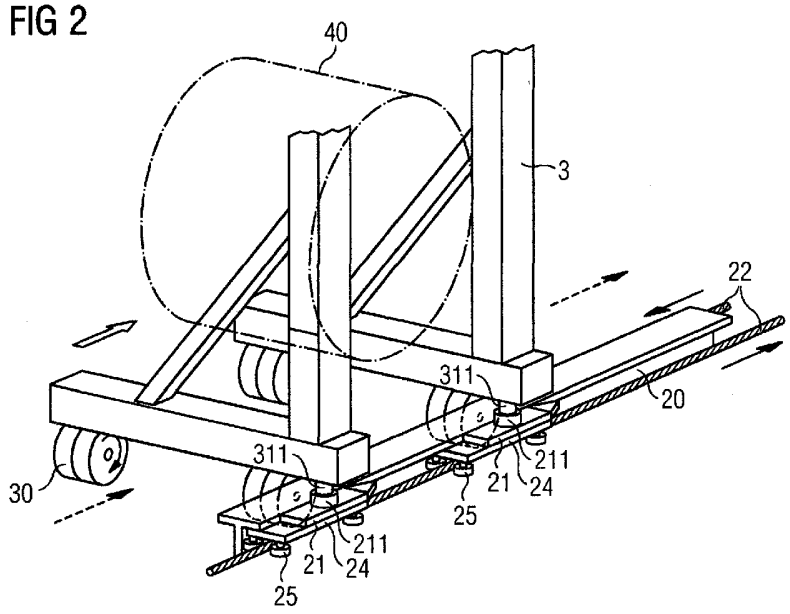

FIG 3