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(54)

Incubator and method for incubating eggs.

(57)

Werkwijze en incubator voor het broeden van eieren in een incubator die een of meer incubator secties omvat, waarbij een luchtstroom wordt gegenereerd binnen elke incubator sectie en waarbij het CO₂ gehalte en de luchtvochtigheid worden gemeten in lucht die gehomogeniseerd is door de luchtstroom. Verse lucht wordt toegevoerd voor het instellen van de gemeten luchtvochtigheid op een streefwaarde zolang als het gemeten CO₂ gehalte onder een vooraf bepaalde bovengrens ligt. De verse lucht wordt gemengd met lucht die al in de incubator aanwezig is voordat de gemengde lucht over de eieren wordt geleid. Wanneer het CO₂ gehalte de bovengrens overstijgt kan de ventilatie worden opgevoerd onafhankelijk van de gemeten luchtvochtigheid en de temperatuur in de incubator.

NL C 2004459

Dit octrooi is verleend ongeacht het bijgevoegde resultaat van het onderzoek naar de stand van de techniek en schriftelijke opinie. Het octrooischrift komt overeen met de oorspronkelijk ingediende stukken.

INCUBATOR AND METHOD FOR INCUBATING EGGS

The present invention relates to an incubator for incubating eggs, in particular eggs of poultry, and to a method of incubating eggs.

5 Artificial incubation of eggs is carried out in incubators with in a closed chamber in which the eggs are placed, e.g., in a tray. The temperature and humidity in the chamber are controlled in order to maintain the eggs at conditions which give incubation periods similar to the incubation periods
10 associated with natural incubation.

During incubation three development stages can be distinguished. In the first phase, the embryo develops from a single cell to an almost fully formed chick. This stage takes
15 about half of the total incubation time. In a second phase, the organs and tissues of the chicks grow to increase in size in readiness for hatching. In a third phase - the actual hatching phase - a series of developments enable the embryo to survive outside the egg shell. First it brakes into the
20 air space within the egg shell (internal pipping), allowing the lungs to start functioning. Subsequently, the chick breaks the shell (external pipping) and emerges as an independent chick.

25 EP 2 105 048 A discloses a method for incubating fertilized poultry eggs at a varying temperature regime, where the temperature is raised in the third stage. Such thermal stimulation of growth requires accurate climate control for all eggs present during the three incubation phases. However,
30 heat generation by the eggs is different per individual egg.

Not only temperature but also relative humidity is an important parameter during incubation. According to WO 2008/141846, chick quality and hatching percentages can be optimized by effective weight loss control by controlling temperature and vapour pressure. Hatchability and chick quality are improved when the eggs lose 10 - 15 % of their initial weight by diffusion of water vapour through pores in the egg shell. This weight loss process can be controlled by controlling the relative humidity of the air within the incubator.

A further parameter influencing incubation processes is the CO_2 / O_2 content ratio. Particularly during the second phase the need for oxygen increases. This requires the supply of fresh air, e.g., by ventilation. Ventilation also assists in the removal of CO_2 and in controlling humidity.

During the incubation process fresh air is introduced into the incubator to adjust moisture content and CO_2/O_2 ratio. During the first phase, the embryo produces little metabolic heat or CO_2 , so air exchange can be low. At the inlet, the fresh air typically has a temperature and relative humidity which is different from the average temperature and relative humidity inside the incubator.

In the incubators interior obstacles may isolate sections of the incubator from the air flow. The trolleys or trays holding the eggs may guide the air flow around the mass of eggs instead of letting the air flow pass evenly between the eggs, thus contributing to an uneven distribution of temperature. Also the used temperature control elements within the incubator can contribute to local temperature variations. These local variations in climate parameters complicate effective climate control.

In present day hatchery industry there is a trend towards large capacity incubators, which may for instance contain as much as 100.000 eggs or more. Such large numbers further complicate climate control.

5

WO 2005/013678 discloses a system for incubator climate control responsive to measurements of bioresponse variables in the micro-environment of a number of individual eggs. However, the number of eggs in an incubator can be very large. To obtain statistically significant measurement results, a large number of eggs should be monitored.

10

It is an object of the present invention to provide an incubator and an incubation method enabling improving effectiveness and accuracy of climate control in an incubator, so as to obtain an improved and uniform chick quality.

15

The object of the invention is achieved with a method of incubating poultry eggs in an incubator comprising one or more incubator sections,

20

- wherein an air flow is generated within each incubator section
- and the CO₂ content and/or the air humidity are measured in air homogenized by the air flow,
- wherein fresh air is supplied to adjust the measured air humidity to a set point value provided that the measured CO₂ content is below a predefined upper limit,
- which fresh air is mixed into air already present in the incubator before the mixed air is guided along the eggs.

25

30

When the measured CO₂ content exceeds the predefined upper limit, the ventilation of the incubator can be increased,

35

regardless of the temperature or air humidity, until the measured CO₂ content is below the upper limit again.

This way, the level of ventilation is controled by time
5 dependent embryo metabolism of all eggs. The climate in the incubator, in particular temperature, humidity and CO₂ level, can be controlled to support embryonic development in an optimal way in all incubated eggs. Natural evaporation of water from the eggs can be kept unaffected, while the
10 incubator meets the time-varying needs of the growing embryo in its different stages of development. Over-ventilation can effectively be avoided. The use of humidifiers can be avoided or minimized. Cold spots in the incubator resulting from excessive ventilation or resulting from the use of
15 humidifiers can be avoided or at least be reduced. No measurements in micro-environments of individual eggs are needed anymore. All eggs are incubated under homogenized and uniform climate conditions, in particular vapour pressure and CO₂ content.

20 Due to the homogenized climate and air composition, the level of ventilation can be optimized. With the system according to the present invention, the climate in the incubator can effectively be controled independent from the climate -
25 including temperature, air humidity and CO₂ levels - outside the incubator.

CO₂ content and relative humidity are closely correlated parameters: if the one becomes too high, the other one will
30 be close to its upper limit as well. If the CO₂ content exceeds its upper limit while the relative humidity is not particularly high, a humidifier may be used to compensate for vapour loss when fresh air is introduced into the incubator to lower the CO₂ content.

Good results have been found when the relative humidity is at most 55 %, e.g., between 50 - 55 %, or between 0,0025 - 0,01 kg moisture per kg air. It was found that embryonic development is optimized if the relative humidity is controlled such that the weight loss of the eggs is about 0,5 - 0,7 % of the initial egg weight per day.

Effective homogenization of the air in the incubator and a uniform climate can be obtained by creating vortices and swirls in the air flow, e.g., by using a vortex generator such as one or more fans having blades shaped to maximize generation of vortices.

Optionally, incubators can comprise a number of incubator sections, where trolleys can be positioned with trays holding the eggs. These sections may be provided with independent temperature control systems. The incubator can for example have two opposite rows of incubator sections. The homogenizing air flow can be arranged per section. For instance, the air flow can be guided around a section before being drawn into it, e.g., by a vortex generator or air pump, such as a radial air pump. This way, the air is thoroughly homogenized before it flows over and between the eggs in the section.

To achieve a uniform climate in the micro-environment around the individual eggs, the eggs can be held in a tray formed by a grid spacing the eggs. This way the air can flow through the grid uniformly along each side of the eggs and the micro-environments of adjacent eggs do not interfere with each other.

The method according to the present invention can effectively be realized with an incubator for incubating fertilized poultry eggs, the incubator comprising one or more sections

with an air inlet, an air flow generator configured to homogenize fresh air from the air inlet and air already present in the incubator, wherein the air inlets comprise a control unit responsive to sensors for measuring the air
5 humidity and the CO₂ content in the incubator. The control units of the air inlets can for example comprise an interface for the input of a set point value for the air humidity and/or an upper limit of the CO₂ content. This way the operator can have full control over the incubation process
10 and tailor it, e.g., to the type of poultry eggs.

Each section of the incubator can have a separate temperature control system. Such a temperature control system can for instance include one or more coolers and/or one or more
15 heaters.

Very effective homogenization of the incubator air can be obtained if at least part of the sections comprise one or more vortex generators with fan blades at least partly having
20 a curved cross section with a convex side facing a wall of the incubator section. The air ducts can be provided at the convex side of the blades extending in the longitudinal direction of the blades, which air ducts are operatively connected to the air inlet.

25 Such air ducts on the blades work as a radial pump. Fresh air can be pumped into the incubator via the air ducts to create an air flow. Due to the convex shape of the blades vortices are generated in the air flow, which intensify mixing of the
30 fresh air with the air present in the incubator.

The air inlet can for instance be located at the ceiling of the incubator. The air can flow via a vertical channel to the vortex generators hub, where it is guided to the air ducts of
35 the vortex generator blades.

The incubator sections can be provided with partitions for guiding the air flow from the blades of the vortex generator to the opposite side of the incubator room where the air flow is drawn to the vortex generator. This way, the fresh air flows over the present eggs only after intense mixing with present air and after thorough homogenization. The blades of the vortex generator draw the created air flow vortices over the eggs. As a result, a very uniform climate for all eggs can be obtained.

The curved cross section of the blades can for example have a trailing edge which is substantially vertical and a leading edge which is substantially horizontal when the blade is in a horizontal position. In this context, the leading edge is the longitudinal blade edge passing first when the blade rotates, while the trailing edge is the longitudinal edge which passes last. The curved section can have a curvature with a radius gradually decreasing from the tail edge to the front edge. It has been found that with such a blade geometry high concentrations of vortices and swirls can be realized in the wake of the blades.

Optionally, the incubator section can be provided with one or more heating and/or cooling elements and/or humidifiers and/or dehumidifiers and/or one or more oxygen supplies for further climate control.

The incubator will generally comprise a number of sections, e.g., six section in two rows of three, but if so desired, the incubator can have only a single section.

The incubator can for instance be used for chicken eggs, duck eggs, turkey eggs or eggs of any other type of poultry.

The present invention will be elucidated with reference to the figures wherein:

- Figure 1: shows schematically in plan view an incubator
5 according to the present invention;
- Figure 2: shows a cross section of the incubator along
line A-A in Figure 1;
- Figure 3: shows a cross section of the incubator along
line B-B in Figure 1;
- 10 Figure 4: shows in perspective view a vortex generator of
the incubator of Figure 1;
- Figure 5: shows a side view of the vortex generator of
Figure 4;
- Figure 6: shows a front view of the vortex generator of
15 Figure 4.

Figure 1 shows in pan view an incubator 1 according to the present invention. The incubator 1 as shown in the drawing comprises six sections 2 with separate climate control.

- 20 Incubators having fewer sections, e.g., a single section, or having more than six sections can also be used, if so desired. In each section four trolleys 3 can be placed. However, the sections can also be configured to contain less than four or more than four trolleys, if so desired.

25

- Each section 1 comprises a central egg zone 4 where the trolleys 3 are placed. The trolleys 3 comprise a number of trays 5 for holding poultry eggs (see Figure 2). The trays 5 can be tilted between a $+45^\circ$ position, a horizontal position
30 and a -45° position. During incubation, the trays 5 are regularly tilted between these positions to imitate the natural breeding process wherein a hen regularly turns her eggs.

The sections 2 comprise a vortex generator 10 with a number of blades 11 (in this case four blades), which is shown in more detail in Figures 4, 5 and 6. The blades 11 show a curved cross section with a leading edge 12 being

5 substantially horizontal and a trailing edge 13 being substantially vertical when the blade 11 is in a horizontal position. In operation the blades 11 rotate in the direction from trailing edge 13 to the leading edge 12, as indicated by the arrow A in Figure 4. The radius of the curvature of the

10 blade 11 gradually decreases from the trailing edge 13 to the leading edge 12. The concave side 14 of the blade 11 is directed to the egg zone 4 of the section 1. The convex side 15 is provided with air ducts 16 extending in the longitudinal direction of the blade 11. The air ducts 16

15 comprise a channel 17 with a rectangular or a square cross section. The channel 17 is capped by a C-shaped cover 18 with longitudinal edges 19, 20 attached to the blade 11 (see Figure 5). The C-shaped cover 18 and the blade 11 enclose a space 21 where the square channel 17 fits in. As shown in

20 Figure 3, the C-shaped cover 18 and the blade 11 each comprise two protruding ribs 22, 23 within the space 21 extending in longitudinal direction of the blades 11 to hold the channel 17. The blades 11 are carried by a hub 25 which is rotatably driven by a computer-controlled electromotor

25 (not shown).

As shown in Figure 2 each section 2 comprises an air inlet channel 26 leading from an air inlet in the ceiling 24 to the hub 25. The hub 25 comprises an interior air channel (not

30 shown) in open connection at one side with the vertical inlet channel 26 and with its other side in open connection with each one of the air ducts 16.

As shown in Figure 6, the blades 11 have a first terminal end

35 27 with a side substantially under right angles with the

longitudinal direction of the blade 11, and a second terminal end 28 shaped with a circle segment cut-out 29 to fit onto the hub 25. Near the cut-out 29, the trailing edge 13 has a section 30 which is bevelled under an acute angle.

5

Due to the shape of the blades, the vortex generator 10 draws air from the egg zone towards itself while it creates vortices in the air flow.

10 The CO₂ content and the relative air humidity of the homogenized air are constantly or regularly measured by sensors (not shown), which can for example be located in a zone between the sections.

15 If the CO₂ content exceeds an upper limit, ventilation of the incubator is increased, regardless of the air humidity or temperature in the incubator. Under such circumstances, these parameters can be controlled by heaters or coolers and by (de)humidifiers within the incubator.

20

If the CO₂ content is below the upper limit, ventilation is used to adjust the air humidity within the incubator to bring it to a predefined set point value.

25 A user interface (not shown) enables an operator to input a desired set point value for the air humidity and an upper limit for the CO₂ content. Ventilation is realized by transporting fresh air from the air inlet via the hub 25 to the air ducts. The sections 2 of the incubator 1 are divided
30 by short baffles 31. When the vortex generator 10 is activated, air is drawn into the incubator 1 via the vertical inlet channel 26, the hub 25 and the air ducts 16, which eject the air radially towards the baffles 31 and to the floor and ceiling respectively. The baffles 31 as well as the
35 floor and the ceiling deflect the air flow by about 90

degrees towards the opposite section 2. Where the air flows from two opposite sections 2 run into each other, the air flows are again deflected and drawn towards the vortex generator 10 by the locally subatmospheric pressure created by the vortex generator 10. Due to the shape and configuration of the blades 11, vortices are created in the air flow as it passes the egg zone 4 and swirls towards the vortex generator 10.

CONCLUSIES

1. Werkwijze voor het broeden van pluimvee eieren in een incubator die een of meer incubator secties omvat,
 - waarbij een luchtstroom wordt gegenereerd binnen elke incubator sectie
- 5 - en waarbij het CO₂ gehalte en de luchtvochtigheid worden gemeten in lucht die gehomogeniseerd is door de luchtstroom,
 - waarbij verse lucht gecontroleerd wordt toegevoerd voor het instellen van de gemeten luchtvochtigheid op een streefwaarde zolang als het gemeten CO₂ gehalte onder een
- 10 vooraf bepaalde bovengrens ligt,
 - welke verse lucht wordt gemengd met lucht die al in de incubator aanwezig is voordat de gemengde lucht over de eieren wordt geleid.
- 15 2. Werkwijze volgens conclusie 1 waarbij de ventilatie wordt opgevoerd onafhankelijk van de gemeten luchtvochtigheid en de temperatuur in de incubator wanneer het CO₂ gehalte de bovengrens overstijgt.
- 20 3. Werkwijze volgens conclusie 1 of 2 waarbij wervelingen of vortices worden opgewekt in de luchtstroom.
4. Werkwijze volgens een van de voorgaande conclusies waarbij de luchtstroom om de incubator sectie heen wordt
- 25 geleid vóór deze in de sectie wordt gezogen.
5. Werkwijze volgens een van de voorgaande conclusies waarbij de verse lucht wordt aangevoerd door middel van een radiaalpompe.
- 30 6. Werkwijze volgens een van de voorgaande conclusies waarbij de eieren worden gehouden in een tray gevormd door een rooster die de eieren op onderlinge afstand houdt.

7. Incubator voor het broeden van bevruchte pluimvee eieren, welke incubator een of meer secties omvat met een luchtinlaat, een luchtstroomgenerator voor het mengen en
5 homogeniseren van verse lucht vanuit de luchtinlaat met lucht die al in de incubator aanwezig is, waarbij de luchtinlaten een besturingseenheid omvatten die reageert op signalen afkomstig van sensors voor het meten van de luchtvochtigheid en het CO₂ gehalte van de gehomogeniseerde gemengde lucht in
10 de incubator.

8. Incubator volgens conclusie 7 waarbij de besturingseenheden van de luchtinlaten een interface omvatten voor de invoer van een streefwaarde voor de luchtvochtigheid
15 en/of van een bovengrens van het CO₂ gehalte.

9. Incubator volgens conclusie 7 of 8 waarbij elke sectie is voorzien van een afzonderlijk temperatuur-beheersingsstelsel, dat een of meer koelers en een of meer
20 verwarmingen omvat.

10. Incubator volgens conclusie 7, 8 of 9 waarbij de luchtstroomgeneratoren een of meer wervel-generatoren of vortex generatoren omvatten met rotorbladen die tenminste
25 gedeeltelijk een gekromde dwarsdoorsnede vertonen met een bolle zijde gericht naar een wand van de incubator sectie, waarbij de bolle zijden van de rotorbladen zijn voorzien van luchttoevoerkanalen die zich uitstrekken in lengterichting van de rotorbladen welke luchttoevoerkanalen functioneel in
30 verbinding staan met de luchtinlaat.

11. Incubator volgens conclusie 10 waarbij de wervel-generator een naaf omvat waarin zich kanalen bevinden die de luchtinlaat verbinden met de luchttoevoerkanalen van de
35 rotorbladen.

12. incubator volgens een van de conclusies 7 - 11 waarbij de incubator sectie is voorzien van schotten voor het geleiden van de luchtstroom.

5

13. Incubator volgens een van de voorgaande conclusies 7 - 12 waarbij de incubator secties zodanig zijn geplaatst dat de luchtstroom van een sectie tenminste gedeeltelijk wordt geleid door de luchtstroom in een of meer belendende secties.

10

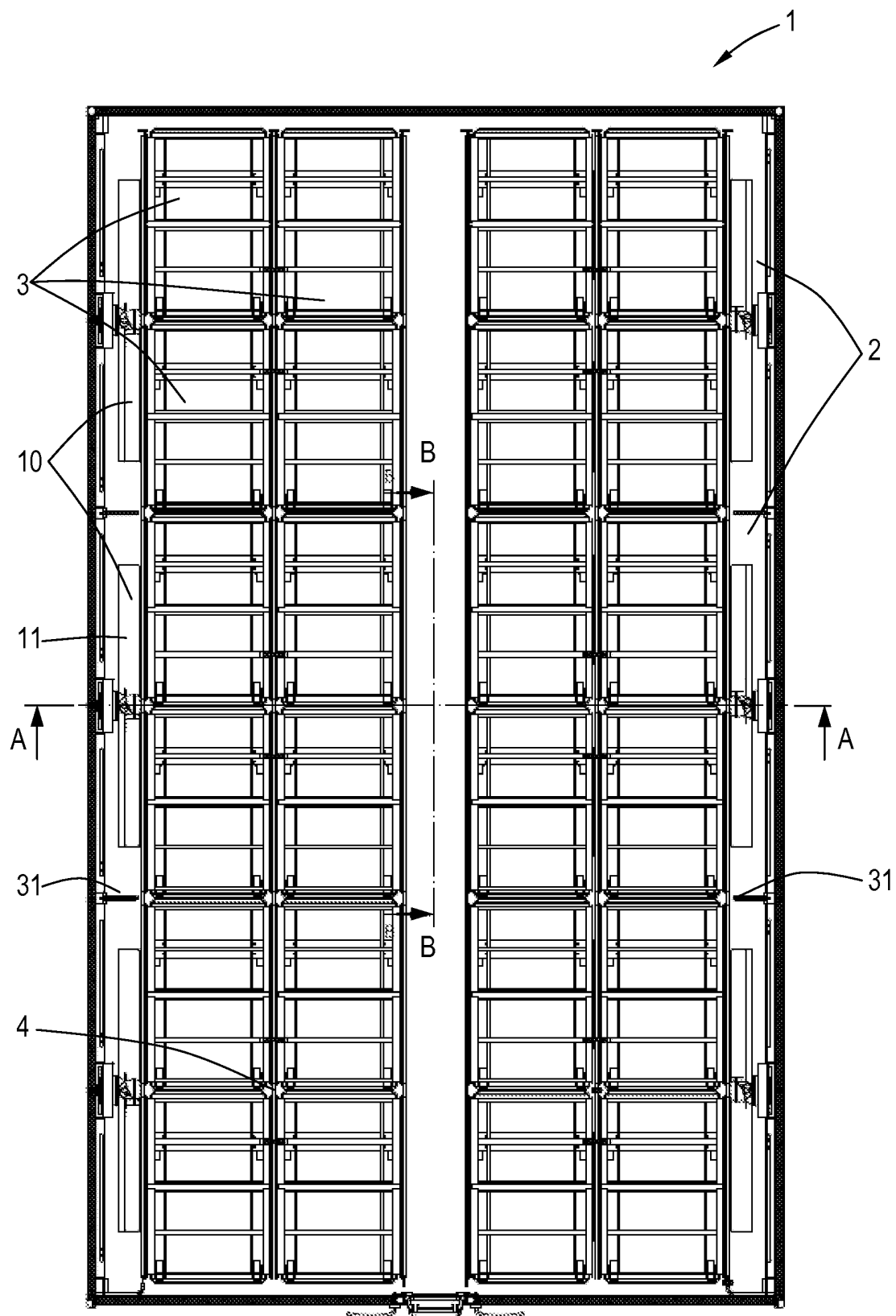
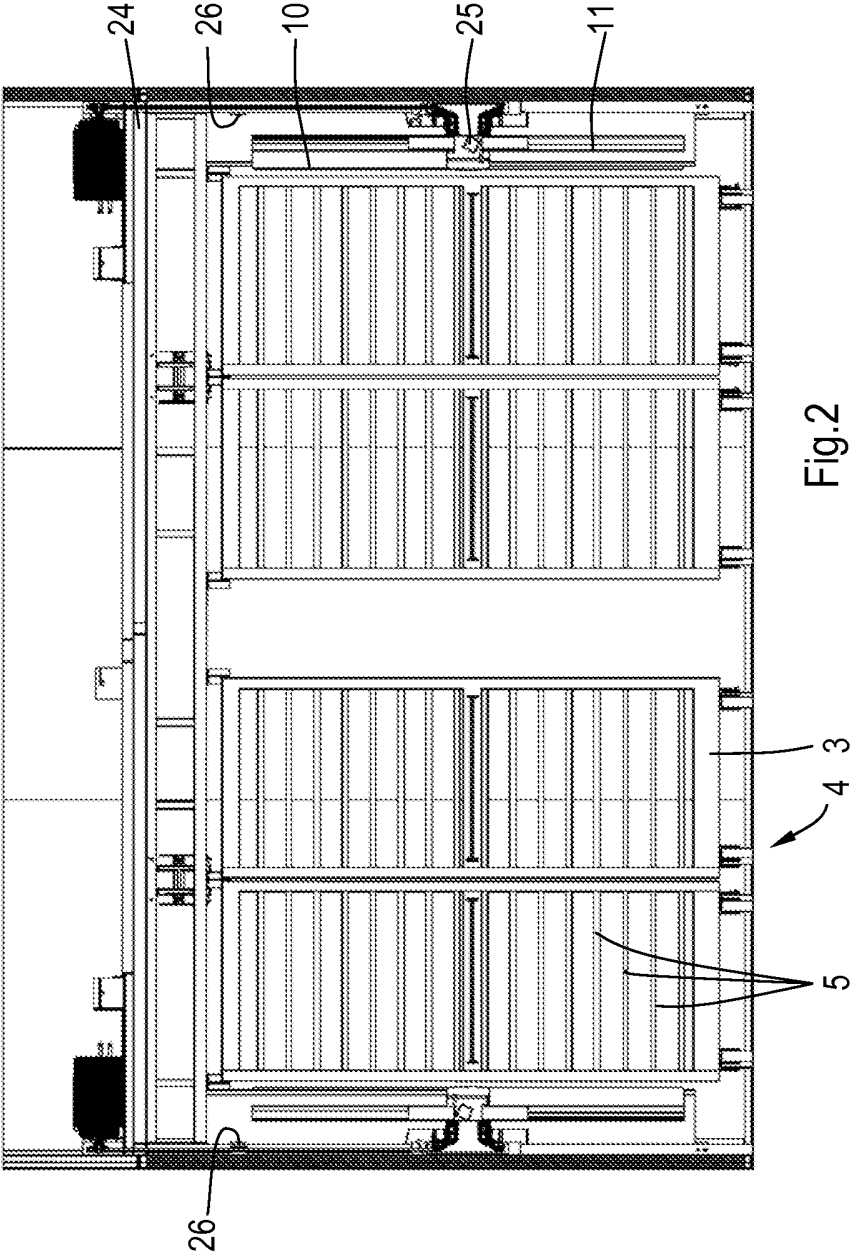


Fig.1



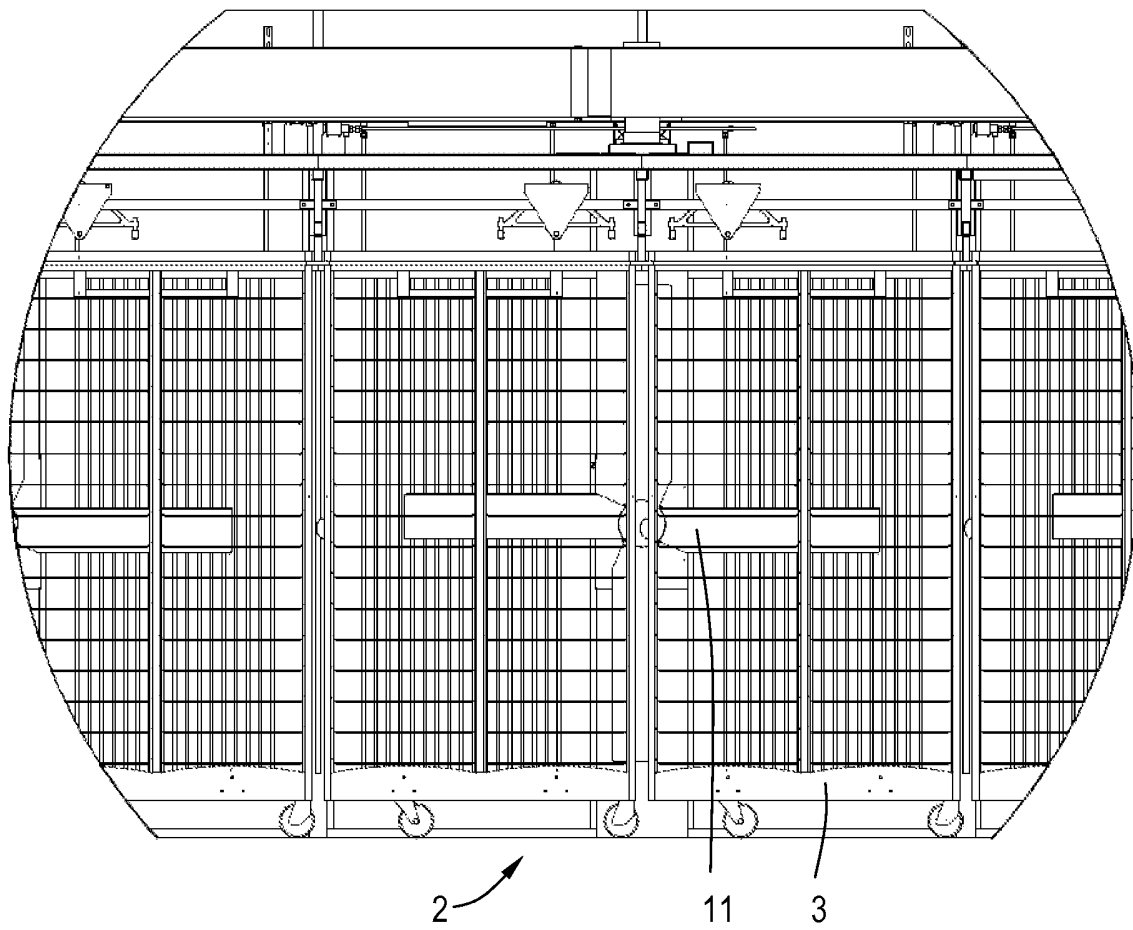
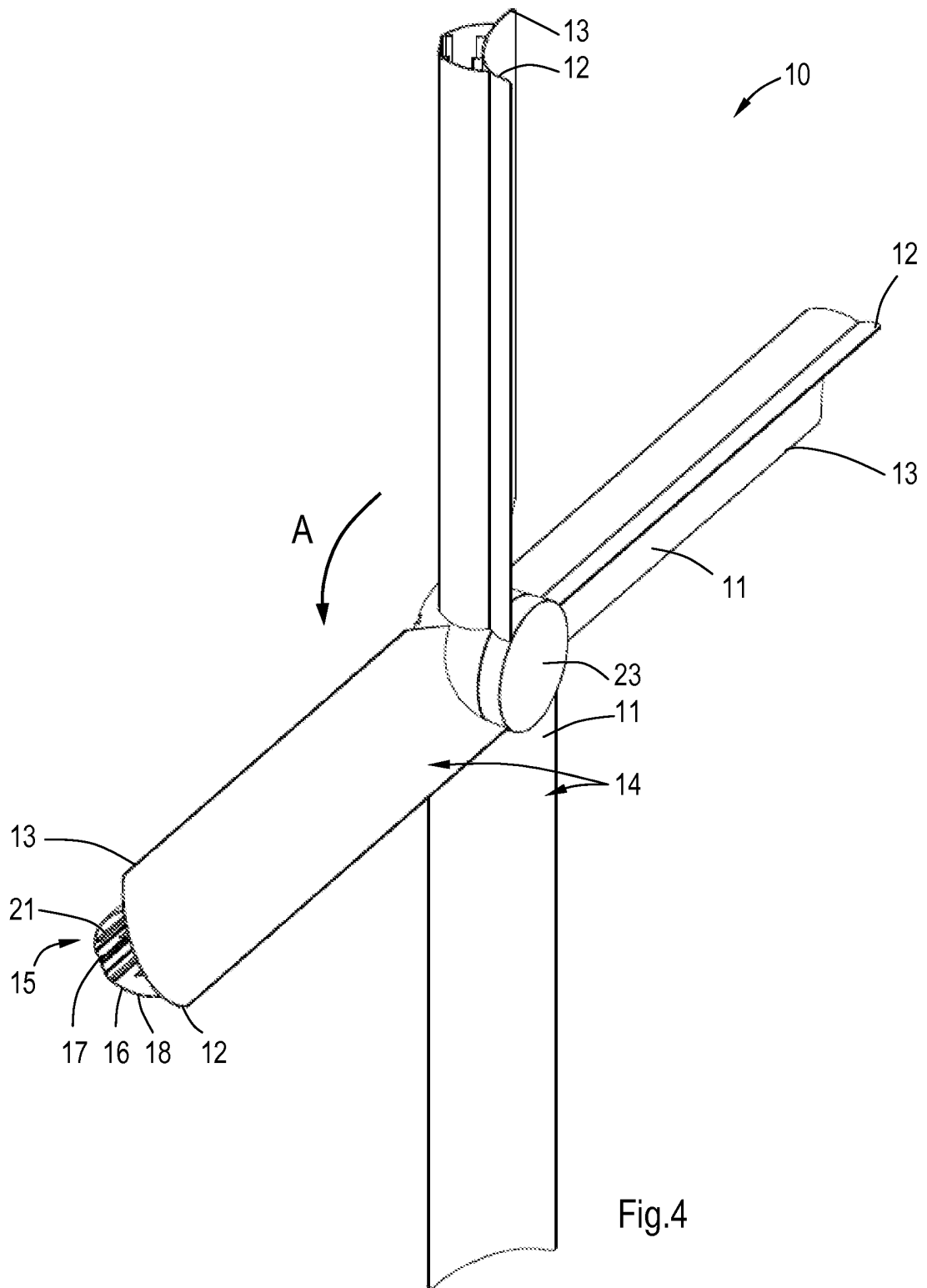


Fig.3



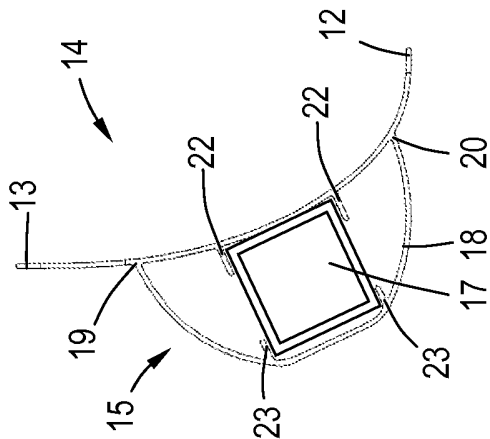


Fig.5

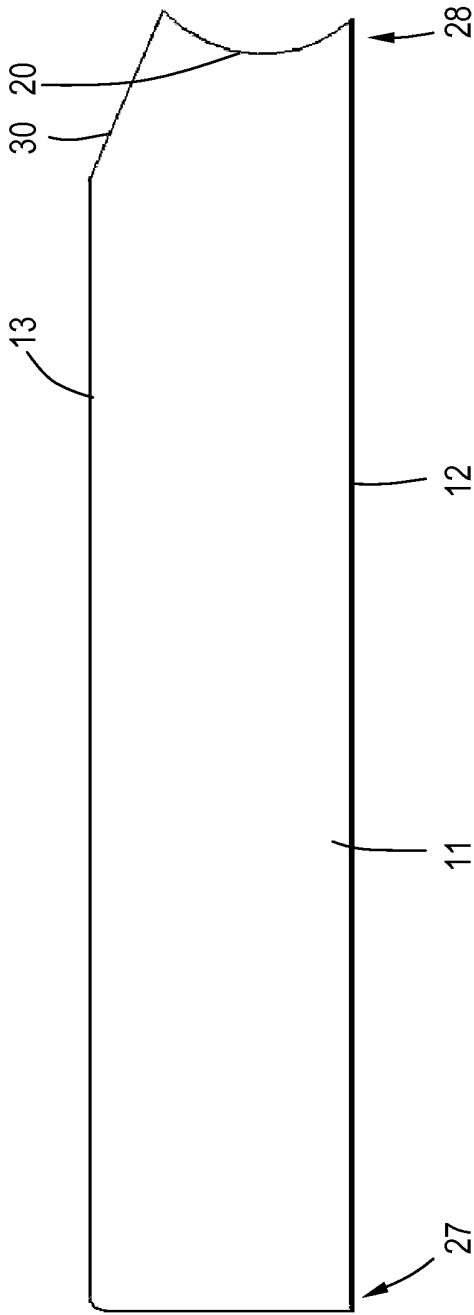


Fig.6

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE	KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE
	NL 14378-ZO/id
Nederlands aanvraag nr.	Indieningsdatum
2004459	25-03-2010
	Ingeroepen voorrangsdatum
Aanvrager (Naam)	
Pas Reform B.V.	
Datum van het verzoek voor een onderzoek van internationaal type	Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr.
26-06-2010	SN 54452
I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)	
Volgens de internationale classificatie (IPC)	
A01K41/00	
II. ONDERZOCHETE GEBIEDEN VAN DE TECHNIEK	
Onderzochte minimumdocumentatie	
Classificatiesysteem	Classificatiesymbolen
IPC8	A01K
Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen	
III. ☐	GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES (opmerkingen op aanvullingsblad)
IV. ☐	GEBREK AAN EENHEID VAN UITVINDING (opmerkingen op aanvullingsblad)

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek
NL 2004459

A. CLASSIFICATIE VAN HET ONDERWERP
INV. A01K41/00
ADD.

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimum documentatie (classificatie gevolgd door classificatiesymbolen)
A01K

Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)
EPO-Internal, PAJ, WPI Data

C. VAN BELANG GEACHTE DOCUMENTEN

Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
X	US 5 657 720 A (WALTERS MATTHEW J [US]) 19 augustus 1997 (1997-08-19) * kolom 7, regel 63 - kolom 8, regel 26 * -----	1-13
X	US 2007/245973 A1 (HUISINGA RICHARD D [US] ET AL) 25 oktober 2007 (2007-10-25) * alinea [0083] * -----	1-13
X	US 6 789 507 B1 (SLATE PAUL DAVIS [US] ET AL) 14 september 2004 (2004-09-14) * kolom 5, regel 64 - kolom 6, regel 21 * -----	1-13
X	US 5 418 131 A (BUTTS CHARLES G [US]) 23 mei 1995 (1995-05-23) * voorbeelden 1,2 * -----	7-13
A		1-6
A	BE 1 011 911 A3 (GRAEVE WIM DE [BE]) 1 februari 2000 (2000-02-01) * het gehele document * -----	1-13

☐ Verdere documenten worden vermeld in het vervolg van vak C.

☒ Leden van dezelfde octrooifamilie zijn vermeld in een bijlage

° Speciale categorieën van aangehaalde documenten

A niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

D in de octrooiaanvraag vermeld

E eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

L om andere redenen vermelde literatuur

O niet-schriftelijke stand van de techniek

P tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

T na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

X de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

Y de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

Z lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid

9 februari 2011

Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type

Naam en adres van de instantie

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

De bevoegde ambtenaar

Van Woensel, Gerry

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2004459

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
US 5657720	A	19-08-1997	GEEN
US 2007245973	A1	25-10-2007	GEEN
US 6789507	B1	14-09-2004	GEEN
US 5418131	A	23-05-1995	DE 69534425 D1 13-10-2005 DE 69534425 T2 29-06-2006 EP 0677740 A2 18-10-1995 JP 3499035 B2 23-02-2004 JP 8015192 A 19-01-1996
BE 1011911	A3	01-02-2000	GEEN



OCTROOICENTRUM NEDERLAND

WRITTEN OPINION

File No. SN54452	Filing date (day/month/year) 25.03.2010	Priority date (day/month/year)	Application No. NL2004459
International Patent Classification (IPC) INV. A01K41/00			
Applicant Pas Reform B.V.			

This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the application
- ☐ Box No. VIII Certain observations on the application

	Examiner Van Woensel, Gerry
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WRITTEN OPINION

Application number
NL2004459

Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the application as filed.
 - ☐ filed together with the application in electronic form.
 - ☐ furnished subsequently for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes: Claims	
	No: Claims	1-13
Inventive step	Yes: Claims	
	No: Claims	1-13
Industrial applicability	Yes: Claims	1-13
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following document(s):

- D1 US 5 657 720 A (WALTERS MATTHEW J [US]) 19 augustus 1997
(1997-08-19)
- D2 US 2007/245973 A1 (HUISINGA RICHARD D [US] ET AL) 25 oktober
2007 (2007-10-25)
- D3 US 6 789 507 B1 (SLATE PAUL DAVIS [US] ET AL) 14 september 2004
(2004-09-14)
- D4 US 5 418 131 A (BUTTS CHARLES G [US]) 23 mei 1995 (1995-05-23)

The present application does not meet the criteria of patentability, because the subject-matter of claim 7 and 1 is not new.

Each of documents D1-D4 discloses (see passages indicated in the Search Report) an incubator comprising:

- sections with an air inlet;
- an air flow generator configured to mix and homogenize fresh air and air already present in the incubator;
- a control unit in the air inlet section, responsive to sensors for measuring the air humidity and the CO₂ content of the homogenized mixed air in the incubator.

Therefore, claim 7 lacks novelty.

The method of claim 1 lacks novelty, *mutatis mutandis*.

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Dependent claims 2-6 and 8-13 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of novelty and/or inventive step, see D1-D5.