

Verification of Translation

I, TONG, JIMMY, of 13th FL., Lotus Bldg. 136 Jen Ai Road, Section 3, Taipei 106, Taiwan, R.O.C. am familiar with both the Chinese and English languages and confirm that the attached English language document is a complete and correct translation of Patent Application No. 63/233,878 filed at the USPTO on August 17, 2021 by **GUDENG PRECISION INDUSTRIAL CO., LTD..**



TONG, JIMMY on November 3, 2021

Device with expanded structure configuration for gas, wafer container including the device, and method related to the device

Prior Art

1. A conventional wafer carrier stores wafers therein and is filled with dry gas (for example, dry air or nitrogen gas), such that the humidity of the interior of the wafer carrier can quickly decrease to less than 10%.
2. In the process of semiconductor fabrication, the opening of the door of the wafer carrier to take out the wafers causes the humidity of the interior of the wafer carrier to rise again instantaneously and leads to an influx of external particles. Therefore, dry air or nitrogen gas has to be introduced into the wafer carrier repeatedly in order to ward off ambient humidity and an influx of external particles.
3. Owing to limited inner surface area of the wafer carrier, the prior art, for example, TW I606534, requires that the path of gas from a feeding hole to an air-permeable round pipe discharging gas should bend in order to blow gas from the air-permeable pipe into the interior of the container.
4. The gas only has one final exit direction. The prior art discloses a round pipe. The round pipe discharges gas at all angles, i.e., 360°, causing turbulent flow inside the container.
5. The semiconductor industry has been around for decades. Nozzles are fixedly mounted on T Load ports and wafers on FOUP, and thus both are unchangeable. Persistent semiconductor technological advancement brings about an everlasting increase in inflation flow rate. The prior art discloses a round pipe. However, to increase the flow rate, its round cross section is enlarged simultaneously at all angles, i.e., 360°, but the enlarged round pipe hits the edges of its wafers; as a result, the area of the round pipe according to the prior art cannot expand.
6. The prior art (TW I606534) discloses that the inflation valve and the inlet connector are offset, and discloses moving its porous pipe (for example, diagram A) away from the wafers (indicated by arrow B). The prior art is restricted to eccentric positions and a round pipe. The axis of the inflation valve does not lie within the slender, longitudinal space of the porous pipe with a view to achieving gas diffusion capabilities. The eccentrically-located gas channel inevitably causes gas flow to wiggle along its course, and thus the gas current's flow to the porous pipe is sluggish and bumpy when compared to a straight channel. Therefore, the prior art is confronted with the issues to be addressed by the present disclosure.

Air-permeable round pipe

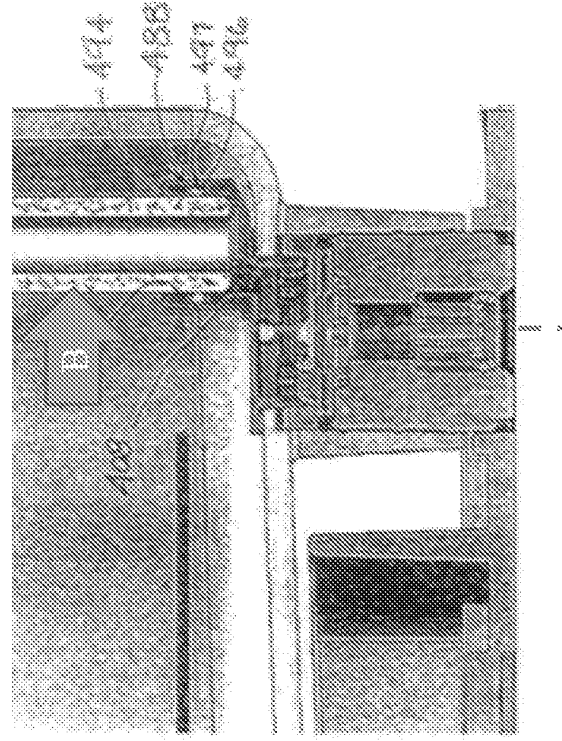


Diagram A-TW I606534

How does the present invention address the aforesaid issues?

1. The new design of the *present invention* has advantageous technical features as follows: the gas channel from the inflation valve to the porous pipe is *modified* to the slender, longitudinal space within the straight porous pipe; and the porous pipe is of any desirable shape subject to changes as needed rather than a round shape, rendering it feasible to change the direction of gas flow and increase the discharging area.
2. The new design of the *present invention* provides a high-performance blow-clean module which features enhanced wiping capabilities and reduced chance of resurging internal humidity otherwise caused by door opening. The advantageous features are attained by a change in the shape of the porous pipe, a change in gas flow path, and the feeding gas channel being straight rather than bent.
3. The new design of the *present invention* is characterized by a baffle disposed at the rear of the porous pipe and adapted to change the gas current direction as needed.
4. The new design of the *present invention* enables the *central axis* of the inflation valve to locate within the cross-sections or the slender, longitudinal spaces of porous pipes of different shapes in order to overcome the drawback of the prior art: the prior art discloses an eccentrically-located inflation valve and an eccentrically-located inlet connector and is restricted to the offset positions and a round pipe with a view to achieving gas diffusion capabilities. However, an eccentrically-located gas channel inevitably causes gas flow to wiggle along its course, and thus the gas flow to the porous pipe is sluggish and bumpy.

FIG.1

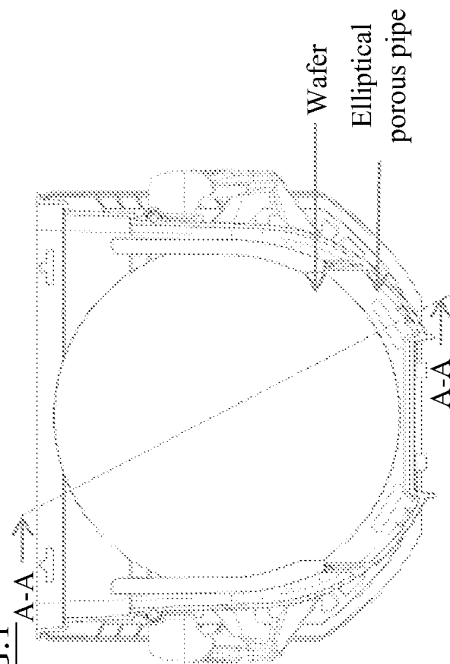


FIG.2

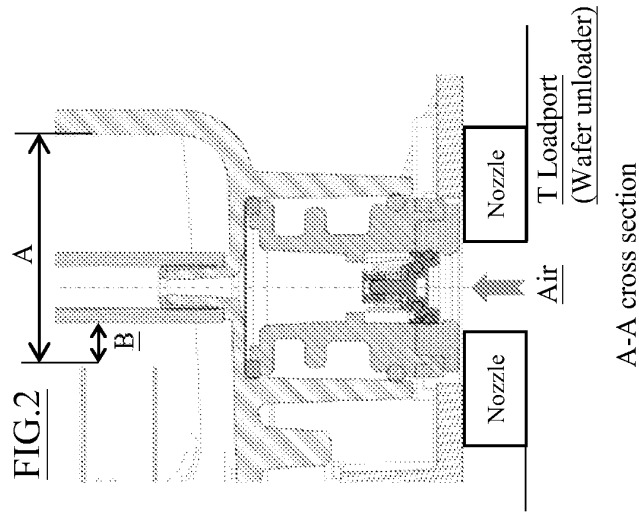
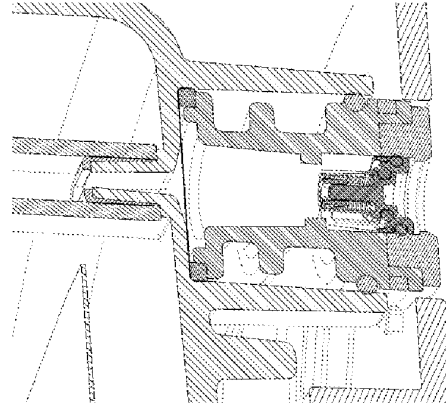
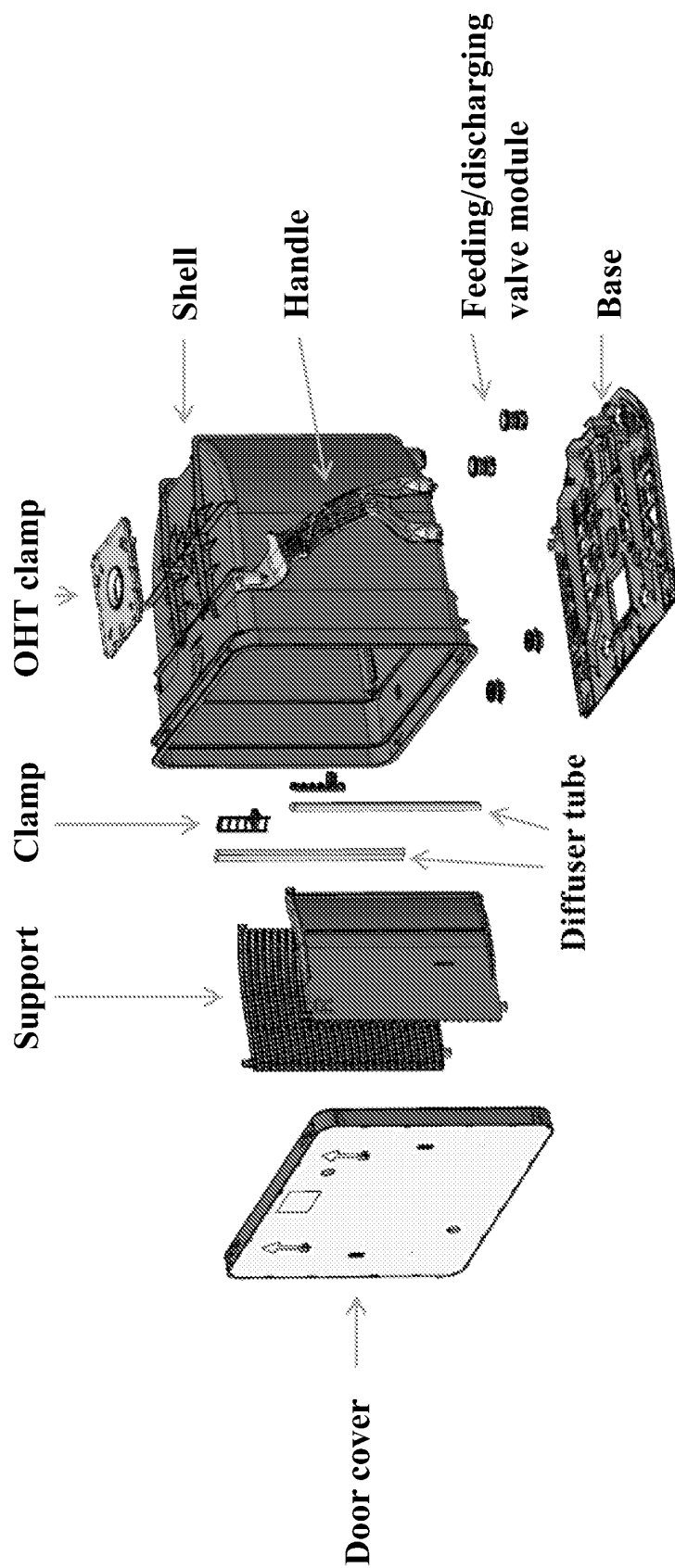


FIG.3





Exploded view

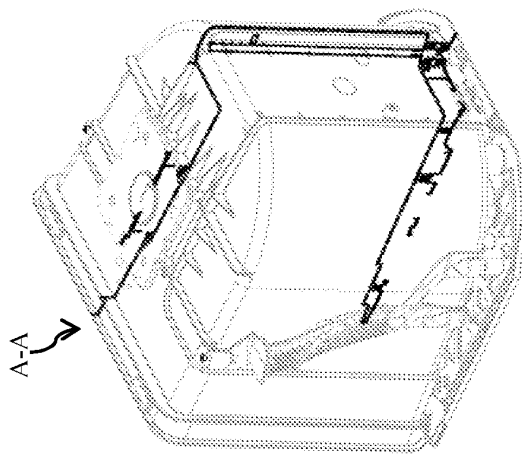


FIG. 4

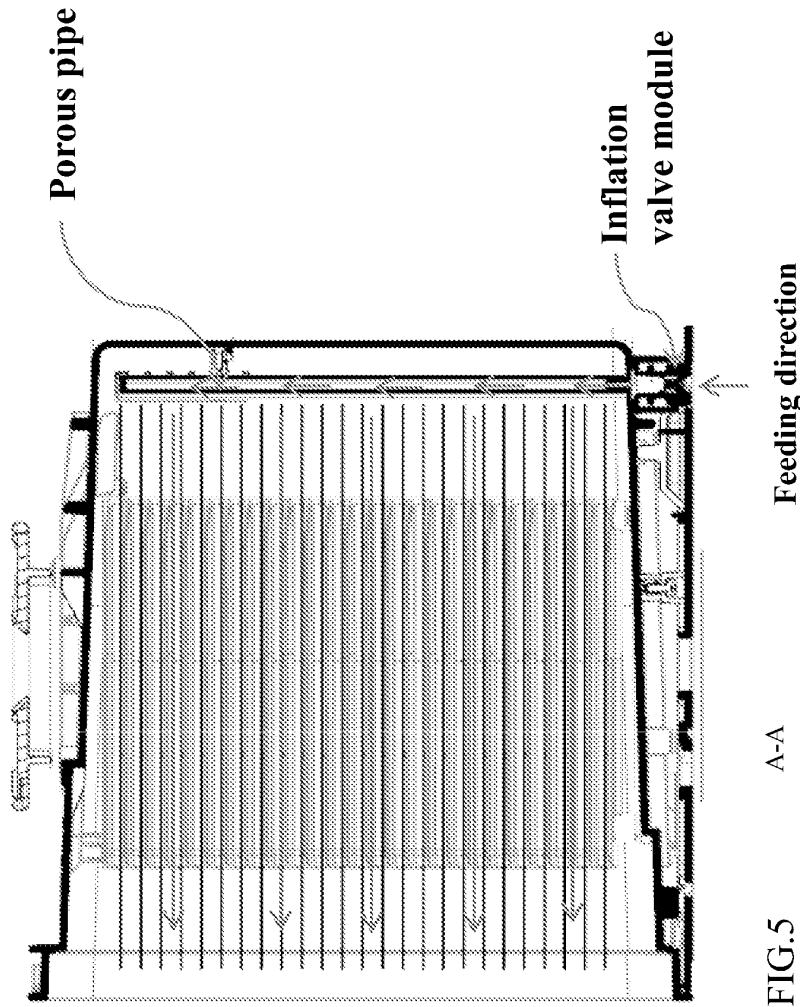


FIG. 5

A-A

1. The gas passes through the inflation valve module and then is diffused outward via the air-permeable porous toward the front opening of the wafer container.
2. Regarding the porous pipe, the height of its top wall from its bottom plate must approximate, as much as possible, to the height of the largest possible number of wafers stacked inside the container or must be at least greater than the height of the upper surface of the uppermost wafer.
3. The gas inside the wafer carrier is extracted and changed with by a gas valve to quickly change the highly humid gas and slow down VOC generation inside the wafer carrier .
4. The direction, angle and form of the porous pipe are subject to changes as needed in order to attain the shortest distance between the central axis of the inflation valve module and the edge of a wafer.

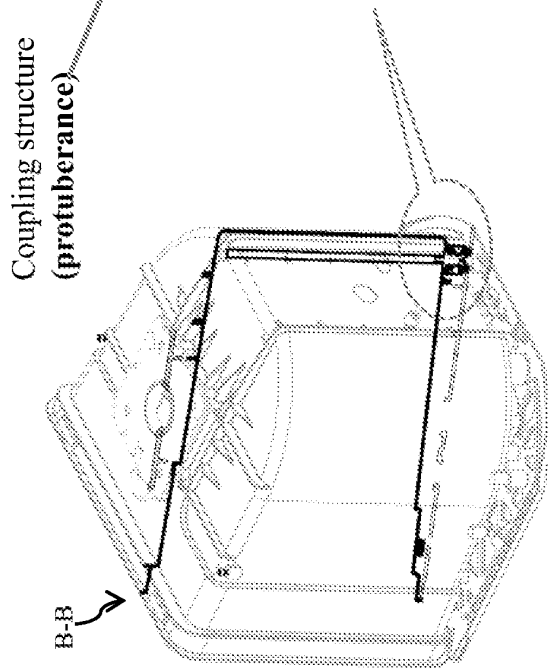


FIG. 6

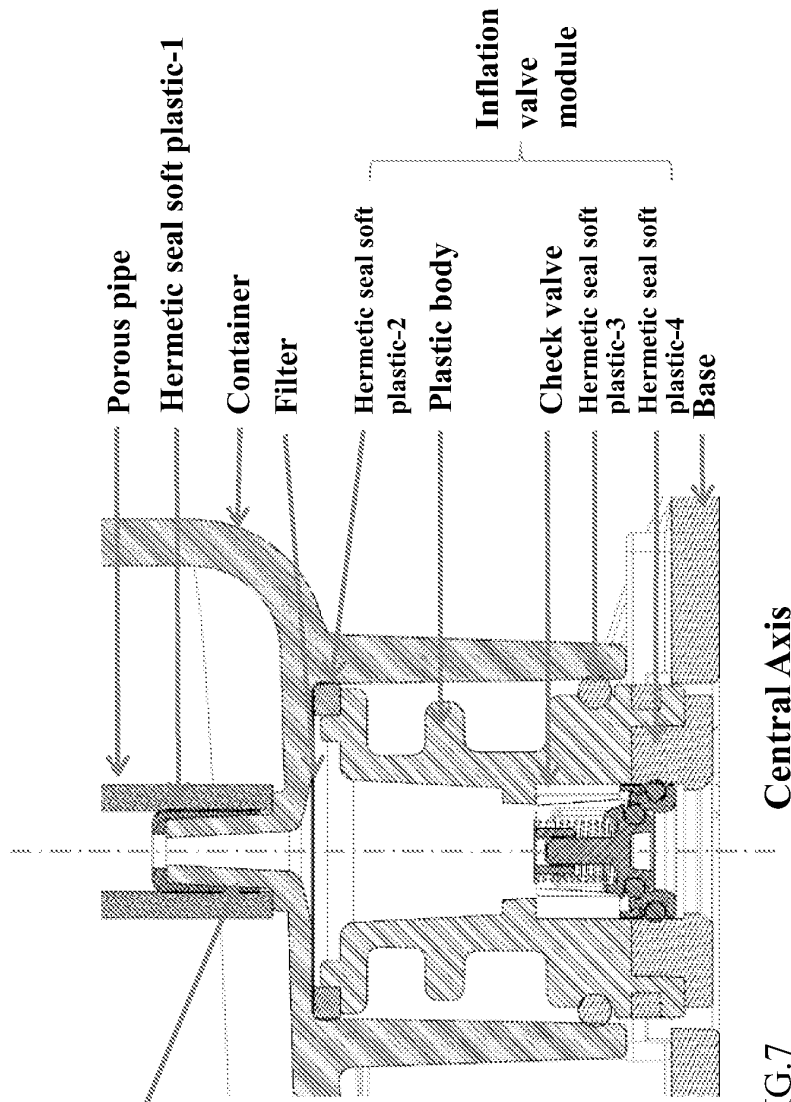
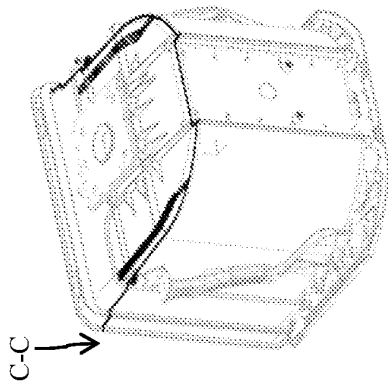


FIG. 7

1. A porous pipe device is disposed on the coupling structure (protuberance) and further disposed a hermetic seal soft plastic - 1 to prevent leakage of gas from the bottom.
2. The inlet connector of the porous pipe and the central axis of the coupling structure (protuberance) share the same axis.
3. The design feature: The central axis of the inflation valve module and the central axis of the coupling structure (protuberance) share the same axis.
4. The design feature: The central axis of the inflation valve module and the central axis of the air-permeable pipe share the same axis.
5. When the external contour of the cross section of the coupling structure (protuberance) matches the internal contour of the cross section of the elliptical porous pipe, such that the elliptical porous pipe mounted in place demonstrates directionality when the elliptical porous pipe is mounted on the coupling structure (protuberance).



Embodiment-1 of the porous pipe

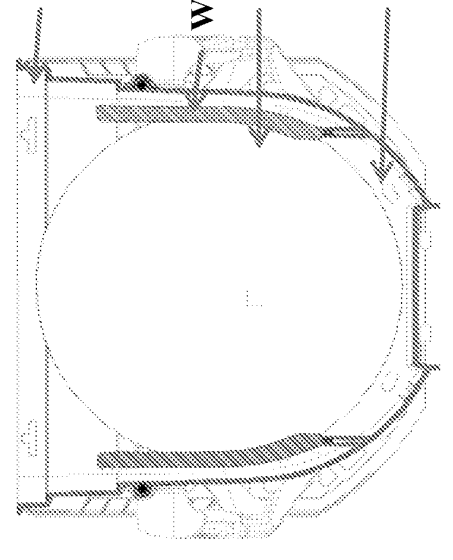


FIG. 8

Embodiment-2 of the porous pipe

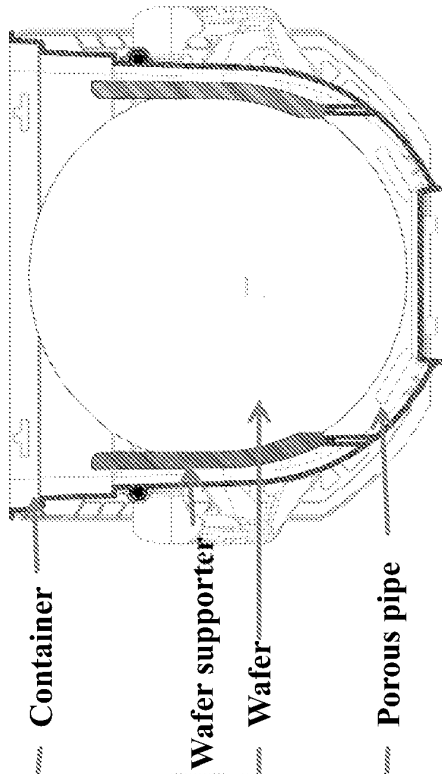


FIG. 9

1. As shown in FIG. 8, a porous round pipe is replaced with a porous elliptical pipe or a porous pipe of any desirable shape to prevent the porous pipe from hitting the edge of a wafer in order to attain the shortest distance between the central axis of the inflation valve and the edge of a wafer.
2. As shown in FIG. 9, air-permeable area of the porous pipe is expanded freely on any other face in order to attain the shortest distance between the central axis of the inflation valve and the edge of a wafer and achieve the maximum beneficial effects.
3. The stacked wafers are separated by wafer supporters.
4. As shown in FIGS. 8, 9, the cross section of the porous pipe has a long axis. Preferably, the long axis is perpendicular to an axis, the axis passes through the cross-sectional center of the porous pipe and the centers of wafers.

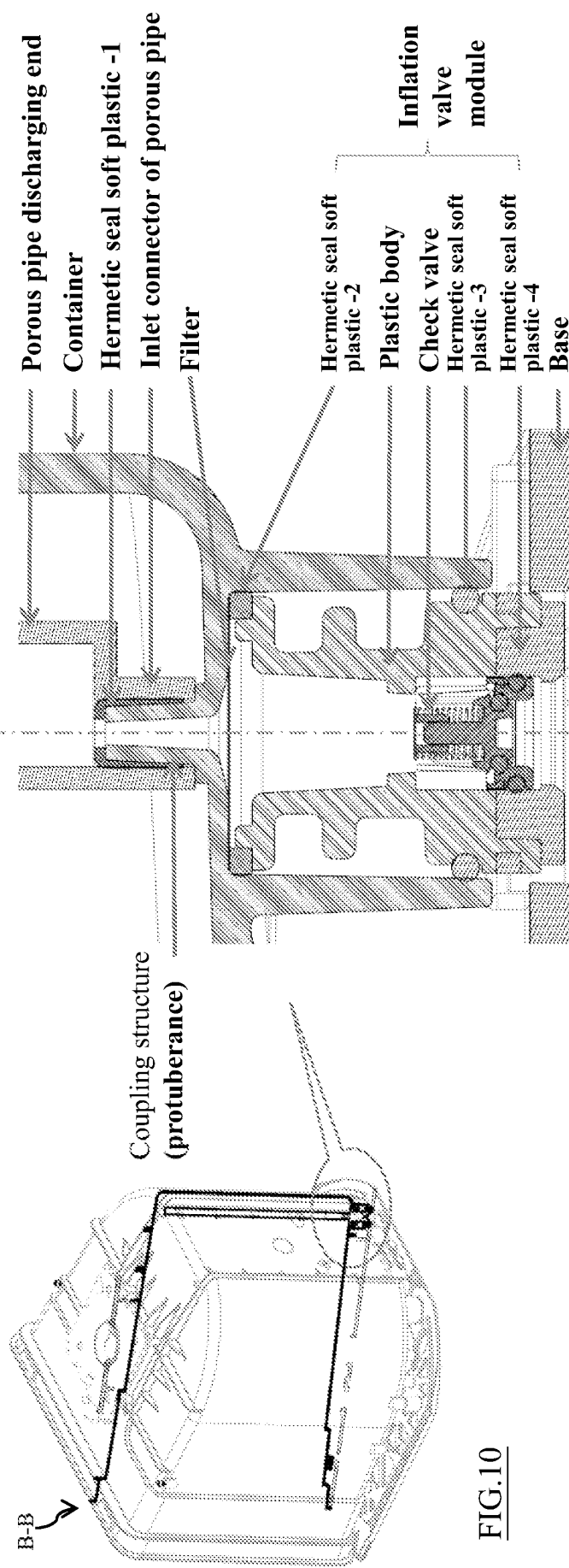
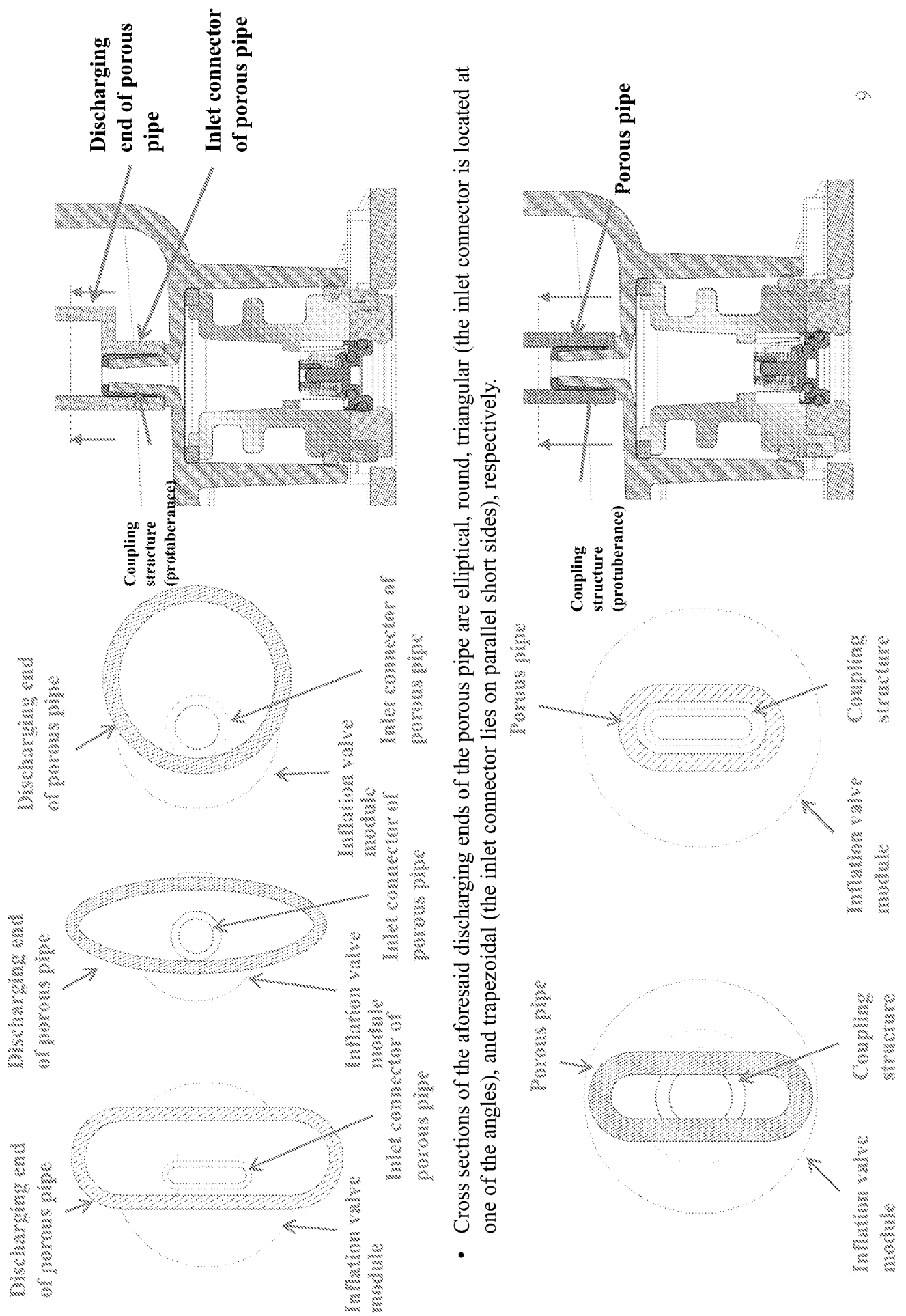


FIG. 11

Central Axis

1. The central axis of the feeding hole of a conventional inflation module is eccentrically-located and thus does not straightly pass through the scope of the cross section or the slender, longitudinal space within a porous pipe and thereby renders the feeding difficult. According to the present invention, the central axis of the feeding hole passes straightly through the scope of the cross section (the surface in contact with the protuberance O-ring -1) or the slender, longitudinal space within the porous pipe and shares the same axis with the protuberance. To attain the shortest distance between the wafer and a surface of the discharging end of the porous pipe, it is feasible to increase the dimensions and change the shape of the cross sections of the other discharging surfaces of the discharging end of the porous pipe, and its central axis is not equidistant from the outer surfaces after the distance change.
2. The central axis of the inlet connector of the porous pipe and the central axis of the discharging end of the porous pipe do not share any axis.
3. The discharging end of the porous pipe and the inlet connector of the porous pipe are made of the same material. Alternatively, the discharging end of the porous pipe and the inlet connector of the porous pipe are made of different materials and then connected or engaged with each other.
4. In different embodiments, the central axis of the inflation valve and the slender, longitudinal space within the porous pipe share the same axis, shown in FIG. 7.
5. In different embodiments, the central axis of the inflation valve and the slender, longitudinal space within the porous pipe do not share any axis, whereas the central axis of the inflation valve and the central axis of the penetrating channel of the coupling structure share the same axis, as shown in FIG. 11.

Cross-sectional view of porous pipes in different embodiments



- Cross sections of the aforesaid discharging ends of the porous pipe are elliptical, round, triangular (the inlet connector is located at one of the angles), and trapezoidal (the inlet connector lies on parallel short sides), respectively.

Embodiment-1 of the porous pipe

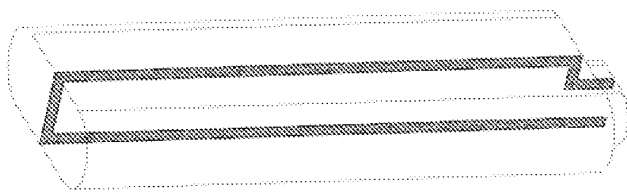


FIG. 12

Embodiment-2 of the porous pipe

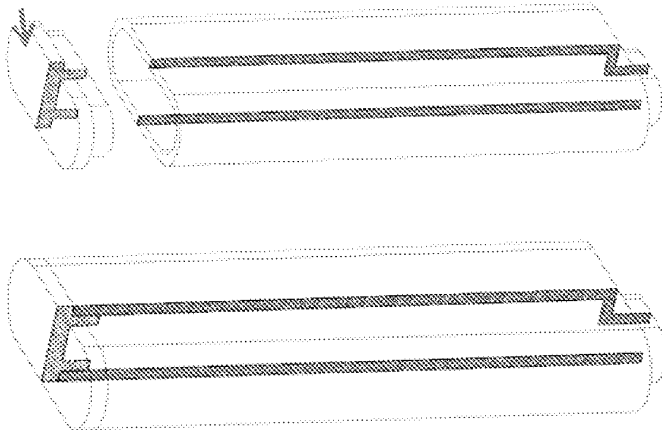
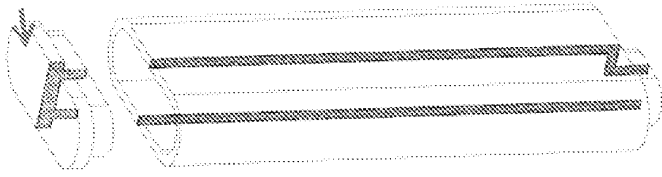


FIG. 13

First base



Porous pipe

- The **discharging end** of the porous pipe forms a slender, longitudinal space. The slender, longitudinal space has a central axis.
- The cross section of the porous pipe has a long axis and a short axis.

Coupling structure

- Has a penetrating channel. The penetrating channel has a central axis and a cross section. The cross section has a long axis and a short axis.
- Is integrally formed with the bottom plate of the container or formed independently thereof.

Central Axis

- According to the arrangement between the axes, the present invention provides a configuration method using an expanded structure for gas for constructing the communication between a porous pipe and an inflation valve.
- The central axis of the inflation valve lies inside the slender, longitudinal space within the porous pipe or the scope of the cross section.
- When the central axis of the slender, longitudinal space within the porous pipe and the central axis of the inflation valve share the same axis, the central axis of the penetrating channel of the coupling structure and the central axis of the inflation valve share the same axis.
- When the central axis of the slender, longitudinal space within the porous pipe and the central axis of the inflation valve do not share any axis, the central axis of the penetrating channel of the coupling structure shares an axis with the central axis of the inflation valve or the central axis of the slender, longitudinal space within the porous pipe.

1. Embodiment-1: The porous pipe is integrally formed.
2. Embodiment-2: A first base is disposed on the side opposite to the entrance of the porous pipe. An O-ring is disposed between the first base and the porous pipe.
3. Embodiment-3: The porous pipe has a first base and a second base. An O-ring is disposed between the first base and the second base.
4. Embodiments-1, 2: The central axis of the slender, longitudinal space within the porous pipe and the central axis of the inflation valve do not share any axis. The central axis of the penetrating channel of the coupling structure and the central axis of the inflation valve share the same axis.

Embodiment-4 of the porous pipe

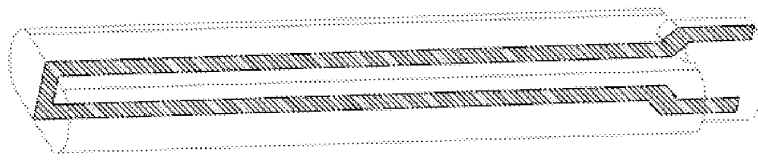


FIG. 15

Embodiment-3 of the porous pipe

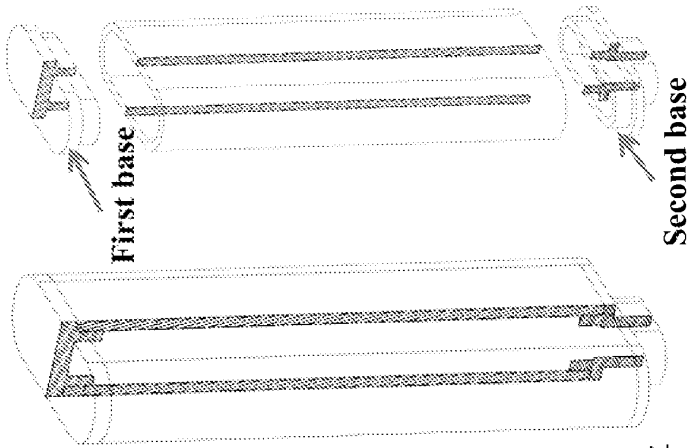


FIG. 14

1. Embodiment-3: The central axis of the slender, longitudinal space within the porous pipe and the central axis of the inflation valve share the same axis. The central axis of the penetrating channel of the coupling structure and the central axis of the inflation valve share the same axis.
2. Embodiment-4: The central axis of the slender, longitudinal space within the porous pipe and the central axis of the inflation valve share the same axis. The central axis of the penetrating channel of the coupling structure and the central axis of the inflation valve share the same axis.

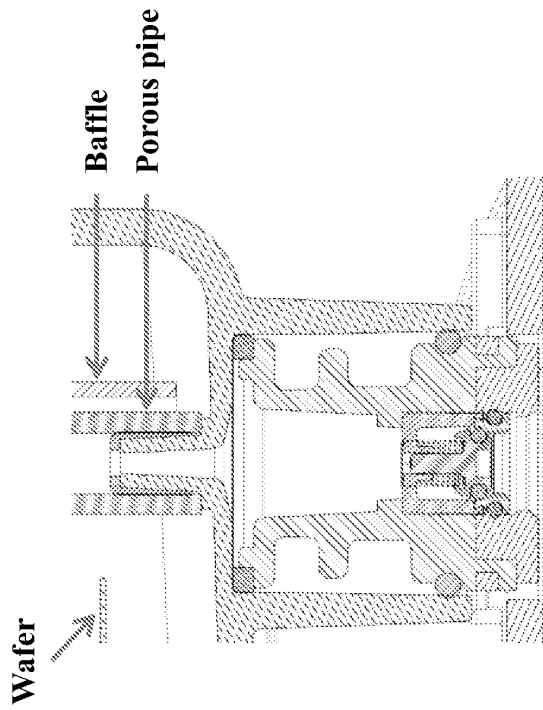


FIG. 16

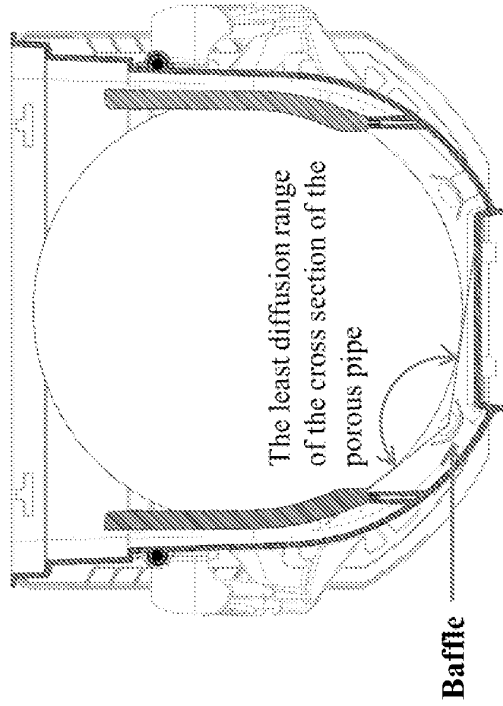


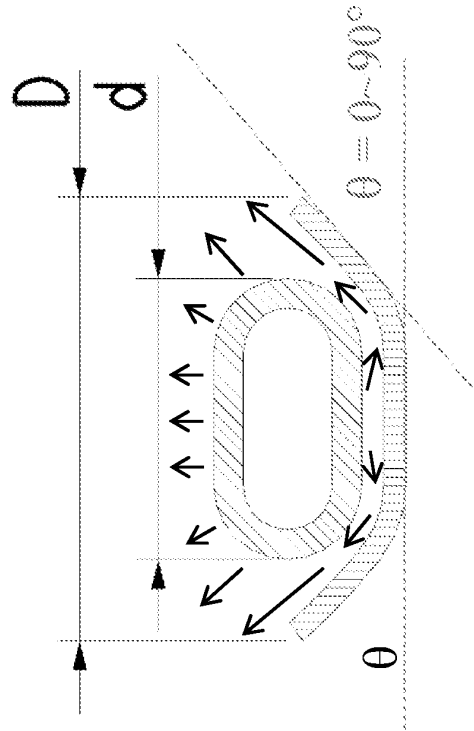
FIG. 17

The least diffusion range of the cross section of the porous pipe is defined by the included angle between left and right tangents of a wafer and the center of the cross section of the porous pipe.

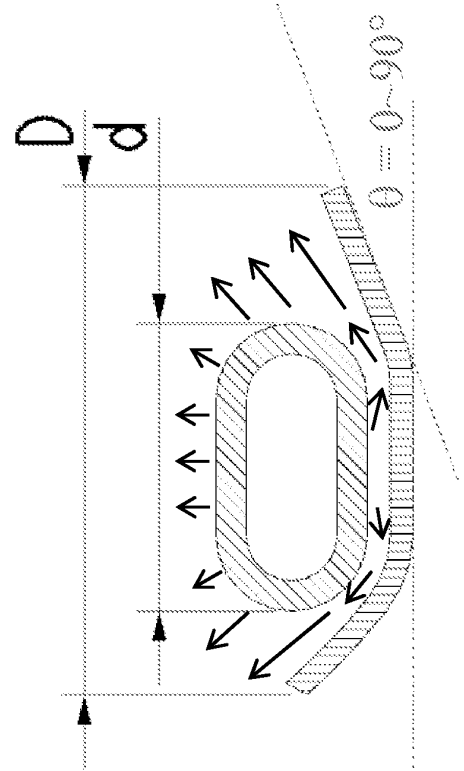
1. The porous pipe carries out 360° discharging. A baffle is disposed on one side of the porous pipe. The baffle manipulates gas flow direction according to the angle and shape of the baffle.
2. The baffle is of the same height as the porous pipe. A left gap and a right gap are formed between the porous pipe and the baffle.
3. There is bilateral symmetry (left gap and right gap open in the same way) or bilateral asymmetry (left gap and right gap open in different ways) between the porous pipe and the baffle, as shown in diagrams below.

Cross-sectional view I of the porous pipe and the baffle in different embodiments

◆ $\underline{D > d}$



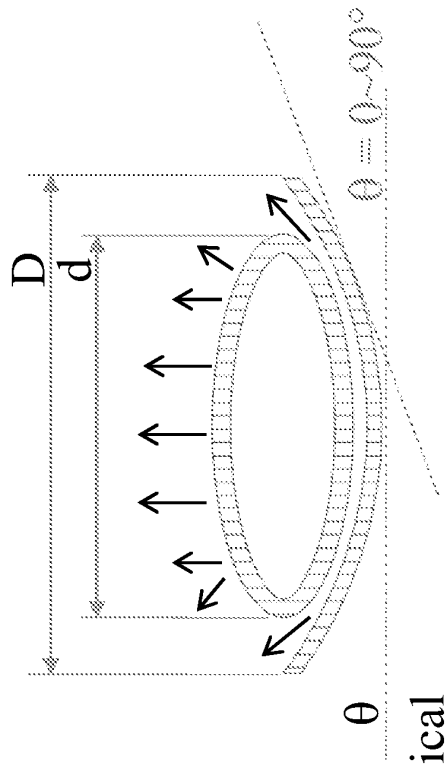
Bilaterally symmetrical



Bilaterally asymmetrical

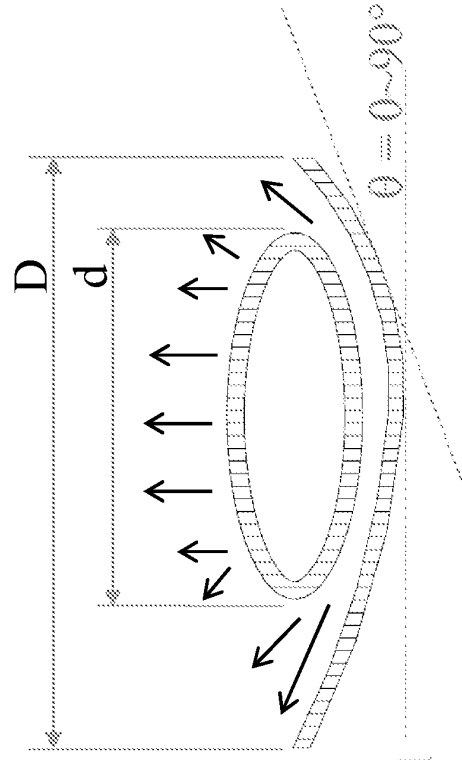
Cross-sectional view II of the porous pipe and the baffle in different embodiments

◆ $\underline{D > d}$



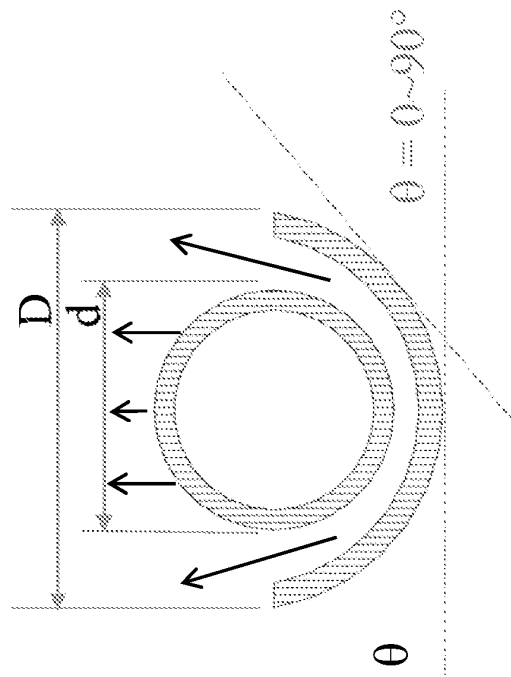
Bilaterally symmetrical

◆ $\underline{D > d}$

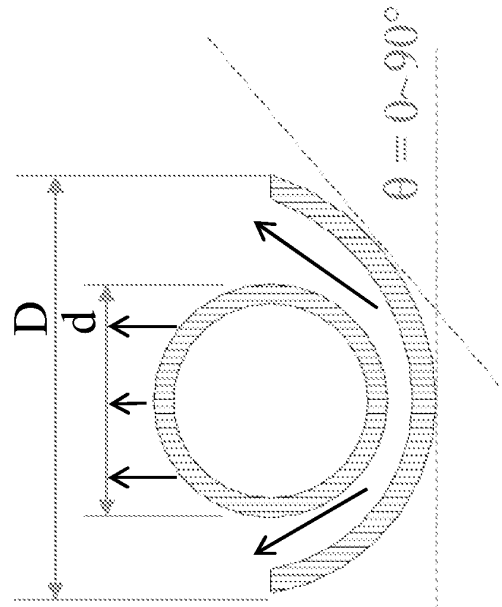


Bilaterally asymmetrical

Cross-sectional view III of the porous pipe and the baffle in different embodiments

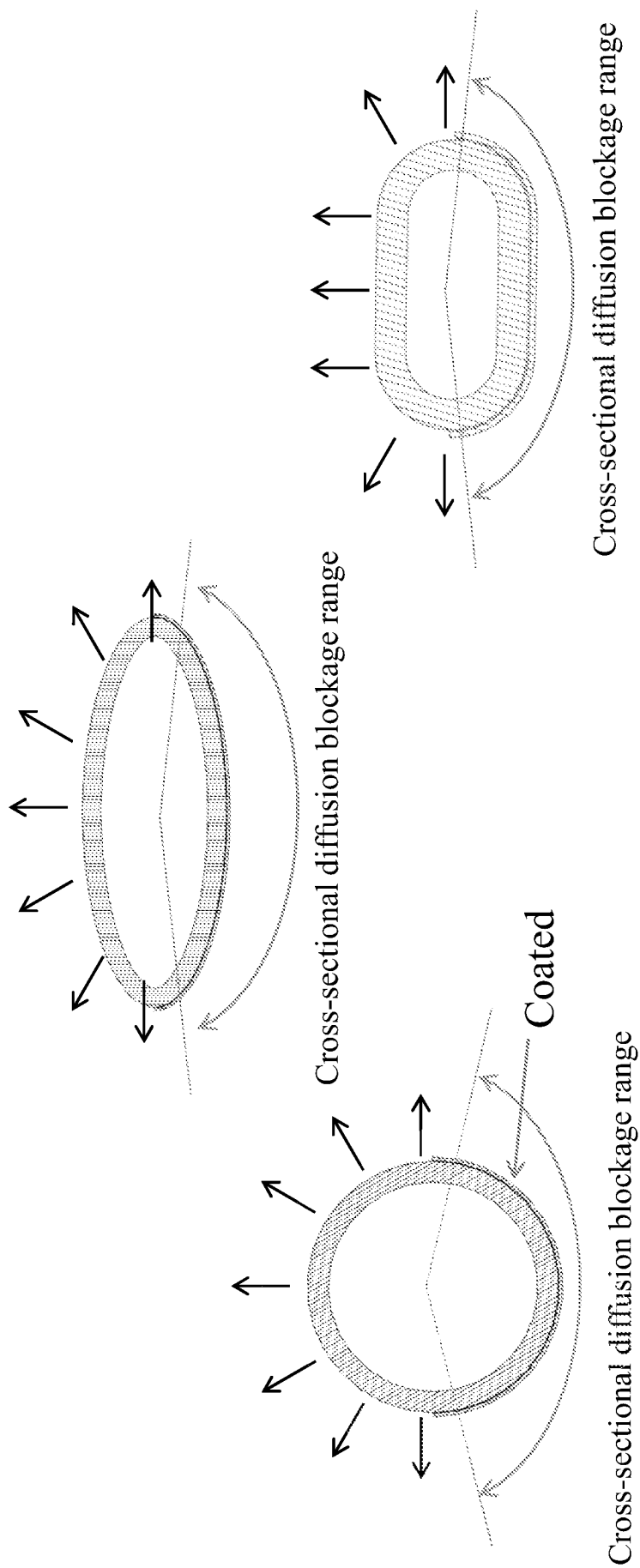


Bilaterally symmetrical



Bilaterally asymmetrical

Cross-sectional views of a porous pipe with at least part of its surface coated in different embodiments



Cross-sectional diffusion blockage range:
10~240° or 5~75%

Technical features to be protected by the present invention

1. A device with configuration of expanded structure for gas, mounted on a wafer container, the wafer container being equipped with at least one inflation valve module defining a feeding channel having a central axis, the device comprising:
 - a coupling structure disposed on a bottom plate of the wafer container, the coupling structure defining a penetrating channel having a central axis; and
 - a porous pipe having a longitudinal space having a central axis, the porous pipe being mounted on the bottom plate of the wafer container through the coupling structure, and the penetrating channel of the coupling structure is in communication with the feeding channel of the inflation valve module and the longitudinal space of the porous pipe, wherein the central axis of the feeding channel lies within the longitudinal space of the porous pipe, wherein the central axis of the feeding channel and the central axis of the longitudinal space do not share any axis.
2. A device with configuration of expanded structure for gas, mounted on a wafer container, the wafer container having at least one inflation valve module, the inflation valve module defining a feeding channel having a central axis, the device comprising:
 - a coupling structure disposed on a bottom plate of the wafer container, the coupling structure defining a penetrating channel having a central axis; and
 - a porous pipe having a longitudinal space having a central axis and a cross section of the longitudinal space has a long axis, the porous pipe mounted on the bottom plate of the wafer container through the coupling structure, and the penetrating channel of the coupling structure is in communication with the feeding channel of the inflation valve module and the longitudinal space of the porous pipe, wherein the central axis of the feeding channel and the central axis of the longitudinal space share the same axis and the cross-sectional long axis of the longitudinal space passes through the central axis of the longitudinal space.
3. A device with configuration of expanded structure for gas, mounted on a wafer container, the wafer container having at least one inflation valve module defining a feeding channel having a central axis, the device comprising:
 - a coupling structure disposed on a bottom plate of the wafer container, the coupling structure defining a penetrating channel having a central axis; and
 - a porous pipe having a longitudinal space, the longitudinal space having a central axis, the porous pipe being mounted on the bottom plate of the wafer container through the coupling structure, and the penetrating channel of the coupling structure is in communication with the feeding channel of the inflation valve module and the longitudinal space of the porous pipe, wherein a baffle is disposed between the porous pipe and a sidewall of the wafer container, the baffle having a surface partially surrounding the porous pipe, so that the porous pipe discharges gas toward the surface of the baffle, and flow direction of the gas is changed by the surface.

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CONFIRMATION NO. 7054
IMPROPER PROVISIONAL LETTER



Date Mailed: 08/30/2021

Letter re Non-English Language Application Papers in a Provisional Application

The above-identified provisional application was filed in a language other than English. An English-language translation of a non-English provisional application and a statement that the translation is accurate must be filed in the provisional application. See 37 CFR 1.78(a)(5). Applicants are strongly encouraged to file the English-language translation of the provisional application and the statement that the translation is accurate in the provisional application before a nonprovisional application claiming the benefit of the provisional application is filed, or, alternatively, when making a claim for the benefit of the provisional application in a nonprovisional application. If, however, an English translation and a statement that the translation is accurate have not been filed in the above-identified provisional application when a nonprovisional application is filed claiming the benefit of the filing date of the provisional application, the Office should mail a Notice requiring an English translation and the statement to be filed in the provisional application and a confirmation to be filed in the nonprovisional application.

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Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

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CONFIRMATION NO. 7054 FILING RECEIPT



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Date Mailed: 08/30/2021

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The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 63/233,878**

Projected Publication Date: None, application is not eligible for pre-grant publication

page 1 of 3

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Early Publication Request: No

**** SMALL ENTITY ****

Title

DIFFUSER FOUP

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

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Application Number

Filing Date

August 17, 2021

First Named Inventor

MING-CHIEN CHIU

Title

DIFFUSER FOUP

Art Unit

Examiner Name

Attorney Docket Number

0114970.255US0

SIGNATURE of Applicant or Patent Practitioner

Signature

/Tim Tingkang Xia/

Date (Optional)

Name

Tim Tingkang Xia

Registration
Number

45242

Title (if Applicant is a
juristic entity)

Attorney of Record

Applicant Name (if Applicant is a juristic entity)

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.



*Total of 1 forms are submitted.

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I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

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I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

21874

OR



I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:



The address associated with the above-mentioned Customer Number

OR



The address associated with Customer Number:

OR

Firm or Individual Name	Locke Lord LLP				
Address	Terminus 200, Suite 1200, 3333 Piedmont Road NE				
City	Atlanta	State	GA	Zip	30305
Country	USA				
Telephone	404-870-4600	Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

GUDENG PRECISION INDUSTRIAL CO., LTD.



Inventor or Joint Inventor (title not required below)



Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)



Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)



Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	<i>Ming-Chien CHU</i>	Date (Optional)	2019.08.05
Name	Ming-Chien CHU		
Title	CEO		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.



Total of 1 forms are submitted.

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Provisional Application for Patent Cover Sheet					
This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)					
Inventor(s)					
Inventor 1					Remove
Given Name	Middle Name	Family Name	City	State	Country ;
MING-CHIEN		CHIU	New Taipei		TW
Inventor 2					Remove
Given Name	Middle Name	Family Name	City	State	Country ;
CHIA-HO		CHUANG	New Taipei		TW
Inventor 3					Remove
Given Name	Middle Name	Family Name	City	State	Country ;
KUO-HUA		LEE	New Taipei		TW
Inventor 4					Remove
Given Name	Middle Name	Family Name	City	State	Country ;
SHU-HUNG		LIN	New Taipei		TW
Inventor 5					Remove
Given Name	Middle Name	Family Name	City	State	Country ;
HAO-KANG		HSIA	New Taipei		TW
All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the Add button.					Add
Title of Invention		DIFFUSER FOUF			
Attorney Docket Number (if applicable)		0114970255US0			
Correspondence Address					
Direct all correspondence to (select one):					
☒ The address corresponding to Customer Number			☐ Firm or Individual Name		
Customer Number			21874		

Doc Code: **TR.PROV**

Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (04-07)

Approved for use through 06/30/2010 OMB 0651-0032

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are:

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Entity Status

Applicant claims small entity status under 37 CFR 1.27

- ☒ Yes, applicant qualifies for small entity status under 37 CFR 1.27
☐ No

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Signature

Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/Tim Tingkang Xia/			Date (YYYY-MM-DD)	Aug 17, 2021
First Name	Tim Tingkang	Last Name	Xia	Registration Number (If appropriate)	45242

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **This form can only be used when in conjunction with EFS-Web. If this form is mailed to the USPTO, it may cause delays in handling the provisional application.**

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

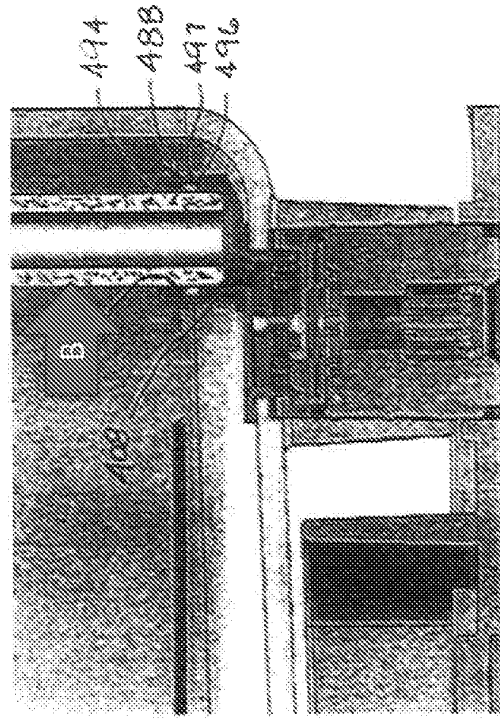
DIFFUSER FOUUP

氣體擴充結構配置裝置、包含該裝置之晶圓容器
及其相關方法

先前技術

1. 載具一般用於儲存放置晶圓片 (Wafer)，並於內部施加乾燥氣體 (如乾燥空氣或氮氣)。使載具內部快速達到10%濕度以下。
2. 在半導體生產過程中。當晶圓片 (Wafer) 於載具內取出時，由於在載具門開啟，會導致內部濕度瞬間回升。及外在particle 內竄。故必須不斷充填乾燥空氣或氮氣，使其抵抗外部之濕度及外部空氣內竄。
3. 已知傳統技術由於受限於載具內部面積因素，氣體從進氣口到透氣圓管出氣之路徑，必須經過彎折才能從透氣管進行容器內部吹拂，如習知技術(TW I606534)。
4. 由於氣體最終只有一個出口方向，已知技術為圓管，此圓管會360度出氣，間接在容器內造成擾流。
5. 半導體產業存在數十年，原有T Load port 上Nozzle及晶圓放置FOUP為固定位置無法變動。再者，半導體技術技術不斷演進，充氣流量不斷增大。現有技術使用圓形管，但為了流量增大，如果將圓形360度同時變大，會導致圓形管撞向其Wafer邊緣，使得現有技術使用圓形管無法擴充其面積。
6. 習知技術(TW I606534)為將充氣閥及入口接頭做偏置，將其多孔管位移(如圖A)使其遠離晶圓(B箭頭處)，以往思維侷限於偏置加上圓形管達到其功能。由於充氣閥的中心軸並不位於多孔管的縱長空間內，因為受限氣道偏置而使氣流進行進間繞折，導致氣流達到多孔管之時間及流暢度會遠比直通通道設計來的不順暢。因此，習知技術存在本發明所欲解決的技術問題。

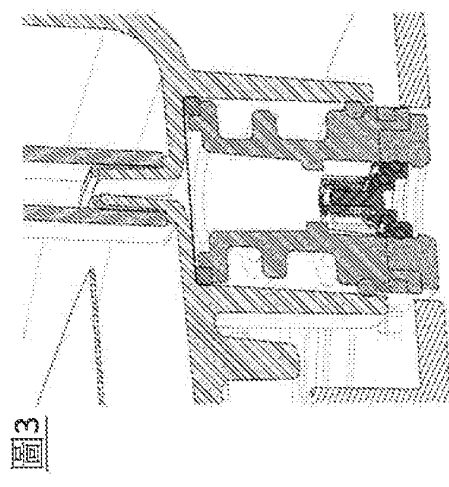
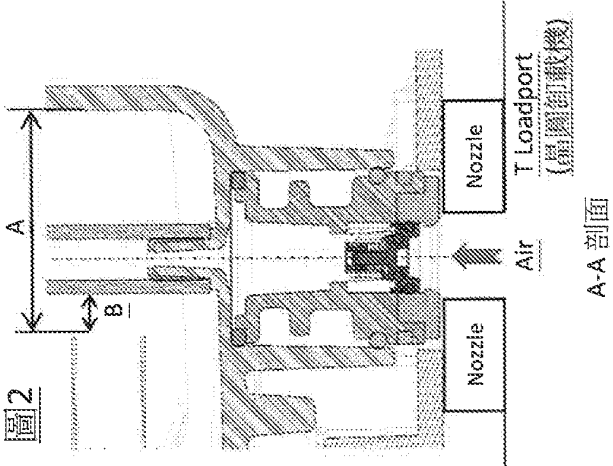
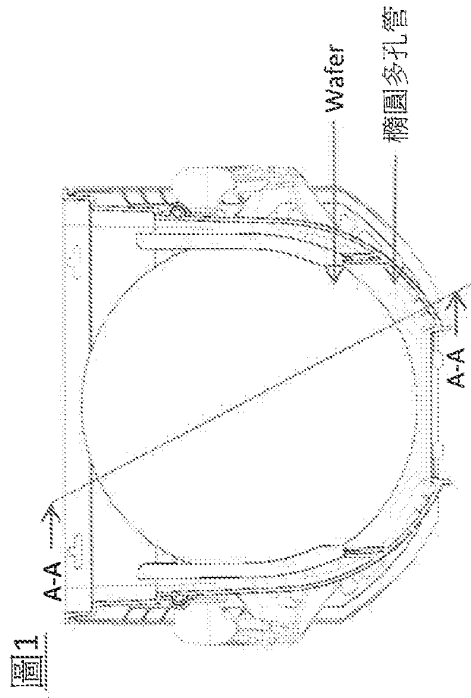
透氣圓管

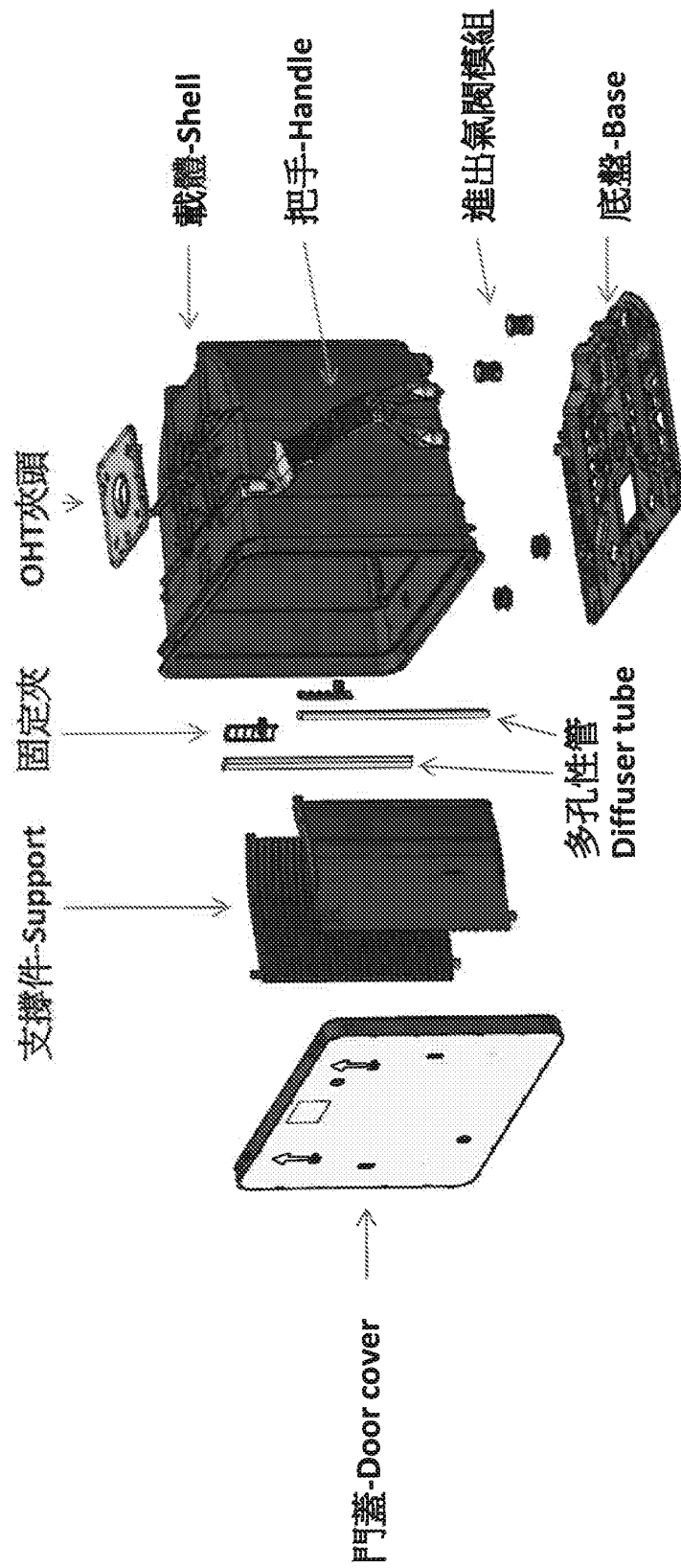


圖A-TW I606534

本發明解決技術問題之手段

1. 新設計發明主要針對從充氣閥進入多孔管的氣體通道修正為直通多孔管的縱長空間內，加上多孔管設計思維為由圓形變成多形狀，使其多孔管形體可以做任意的形狀改變，來達到改變氣流的方向及增大出氣面積。
2. 此新式樣實現了高性能吹洗模組，透過管子形體改變及修改氣體路徑，且進氣氣體通道由轉折變成直通，可以大幅度提升吹掃能力，有效降低開門時內部溼度回升。
3. 新式樣設計在多孔管後方增加檔板，藉由檔板可以任意改變氣流方向。
4. 新式樣設計使充氣閥的中心軸位於不同形體之多孔管的縱長空間內或截面範圍內可解決習知技術為將充氣閥及入口接頭做偏置，侷限於偏置加上圓形管達到氣體擴散功能。但受限氣道偏置會使氣流行進間繞折，導致氣流達到多孔管之時間及流暢度不順暢之技術問題。





爆炸圖

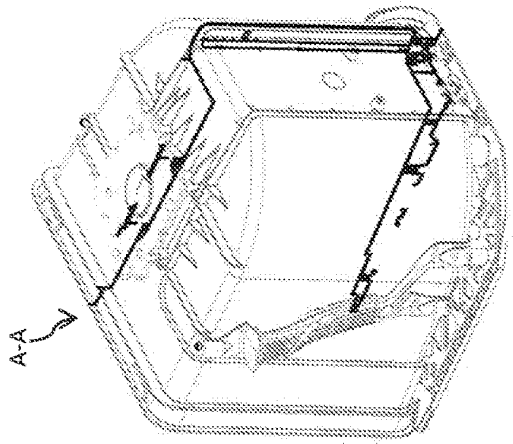


圖4

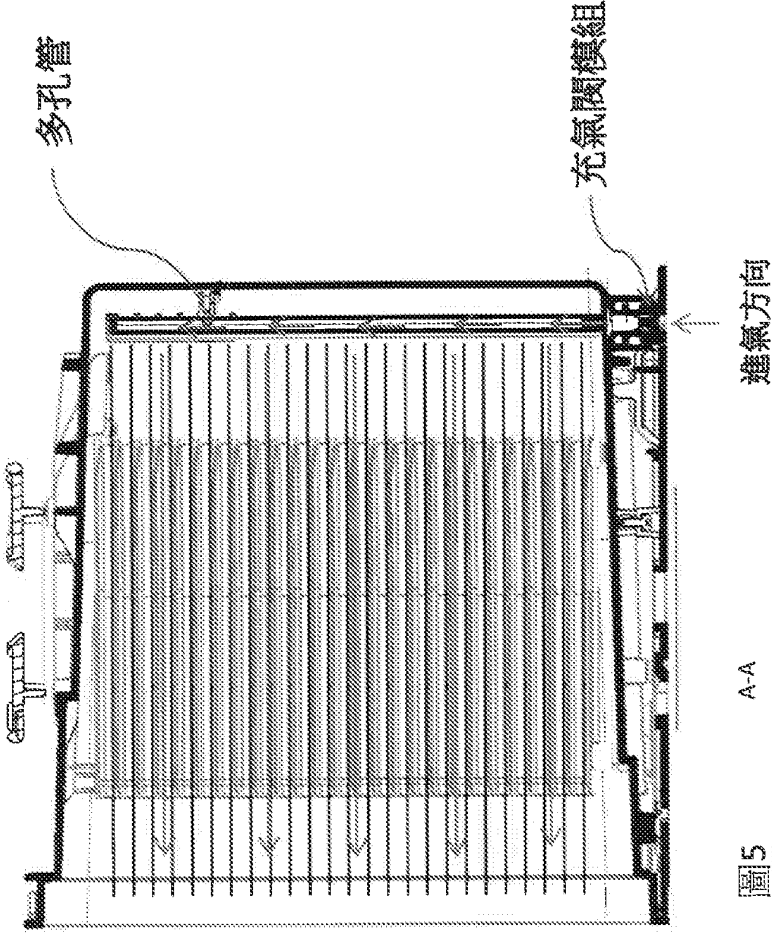
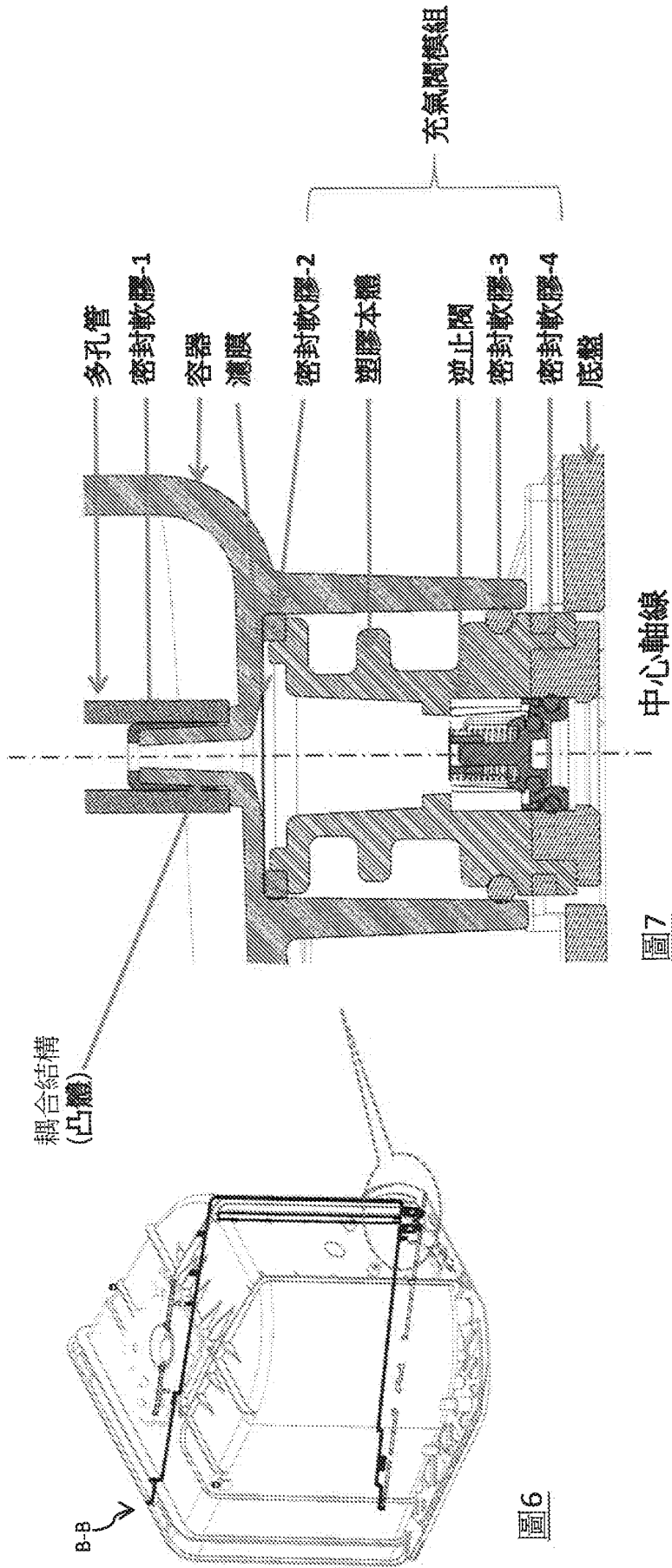


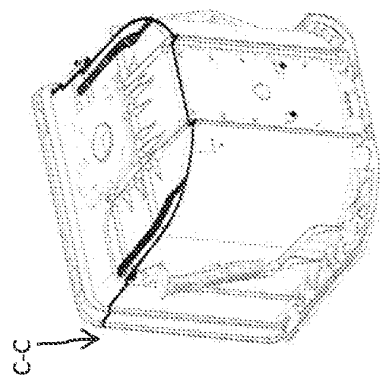
圖5

A-A

1. 氣體通過充氣閥模組，經由透氣多孔管將氣體擴散出去，往晶圓容器前方開口排出。
2. 多孔管自底板往頂壁所延伸的高度，盡可能覆蓋到該容器所能容納最大數量晶圓之堆疊高度，或至少大於最高位置的晶圓的上表面。
3. 透過氣閥抽換載具內部氣體，達成快速置換載具內部高濕度氣體及降緩VOC產生。
4. 以充氣閥模組的中心軸距離晶圓邊緣的最短距離為考量，多孔管可以配合需求任何修改方向，角度，形式來達到其效果。



1. 多孔管裝置於耦合結構(凸體)上，並可增設密封軟膠-1防止氣體從底部瀉出。
2. 該多孔管入口接頭與耦合結構(凸體)之中心軸呈現同一軸線
3. 該設計特徵-充氣閥模組之中心軸與耦合結構(凸體)中心軸呈現同一軸線。
4. 該設計特徵-充氣閥模組之中心軸與透氣管中心軸呈現同一軸線。
5. 耦合結構(凸體)的截面外圍輪廓符合橢圓多孔管的截面內圍輪廓，可使橢圓多孔管安裝於耦合結構(凸體)時，該橢圓多孔管的安裝具有定向性。



多孔管實施例-1

多孔管實施例-2

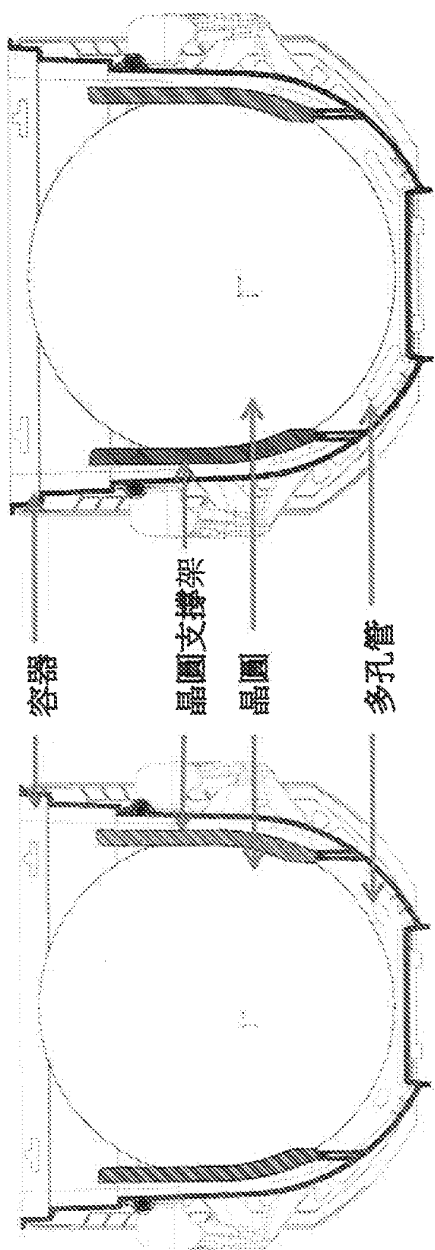
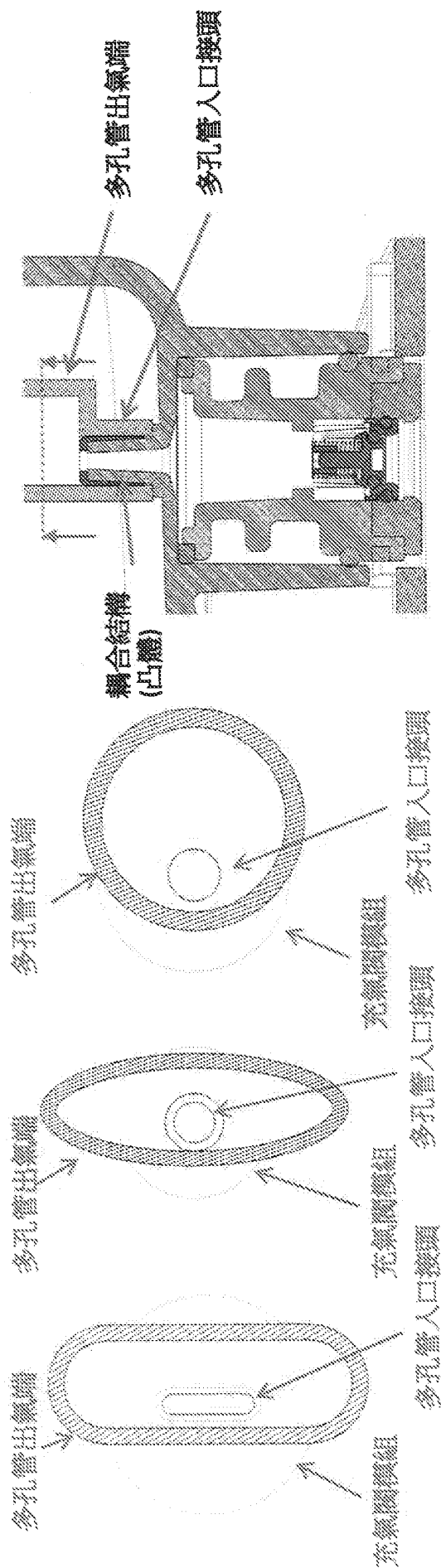


圖9

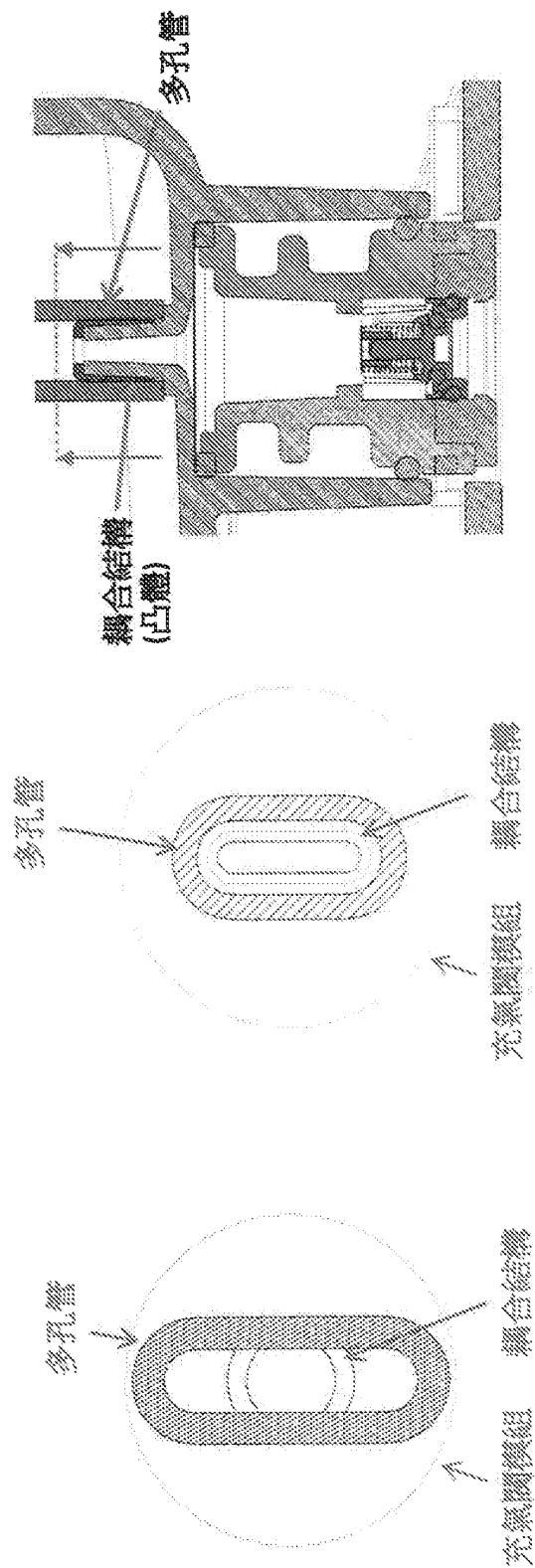
圖8

1. 如圖8以充氣閥的中心軸距離晶圓邊緣的最短距離為考量，將多孔圓柱管改成多孔橢圓柱管或其它形式等多孔管，以避免多孔管碰撞晶圓邊緣。
2. 如圖9以充氣閥的中心軸距離晶圓邊緣的最短距離為考量。該多孔管可以自由向其它面擴展其透氣面積，達到最大效益。
3. 堆疊的晶圓之間由晶圓支撐架所隔開。
4. 如圖8、9所示，多孔管的截面具有一長軸，較佳地，該長軸垂直於一軸，該軸通過該多孔管截面的中心與晶圓的圓心。

不同實施例之多孔管配置之截面剖視圖



• 上述多孔管出氣端的截面形狀，可為橢圓形、圓形、三角形(入口接頭位於其中一角)、梯形(入口接頭位於平行的短邊)



多孔管實施例-1

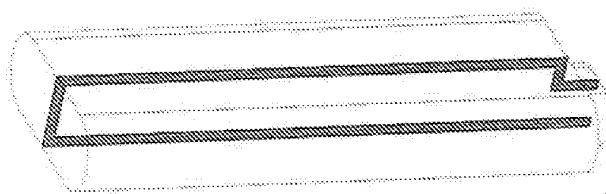


圖 12

多孔管實施例-2

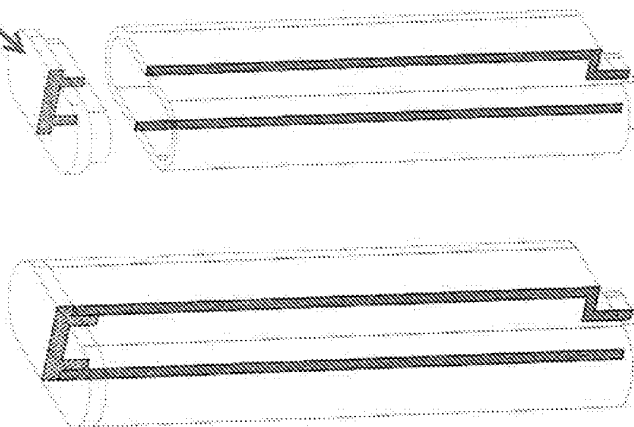


圖 13

第一基座

多孔管

- 多孔管出氣端形成一縱長空間，該縱長空間具有一中心軸。
- 多孔管的截面具有一長軸與一短軸。

耦合結構

- 具有一貫穿通道，該貫穿通道具有一中心軸與一截面，該截面具有一長軸與一短軸。
- 可與容器的底板一體成形或形成單獨構件。

中心軸

- 根據各中心軸之間的配置，本案提供一種氣體擴充結構配置方法，用以建構一多孔管與一充氣閥的連通。
- 充氣閥的中心軸位於多孔管的縱長空間內或截面範圍內。
- 多孔管的縱長空間的中心軸與充氣閥的中心軸同軸時，耦合結構的貫穿通道的中心軸與充氣閥的中心軸同軸。
- 多孔管的縱長空間的中心軸與充氣閥的中心軸不同軸時，耦合結構的貫穿通道的中心軸與充氣閥的中心軸同軸，或與多孔管的縱長空間的中心軸同軸。

1. 實施例-1: 多孔管為一體成型。
2. 實施例-2: 多孔管入口處之對向側設有第一基座。第一基座與多孔管之間可設有密封膠圈。
3. 實施例-3: 多孔管設有第一基座與第二基座。第一基座與第二基座之間可設有密封膠圈。
4. 實施例-1、2，多孔管的縱長空間的中心軸與充氣閥的中心軸不同軸，且耦合結構的貫穿通道的中心軸與充氣閥的中心軸同軸。

多孔管實施例-4

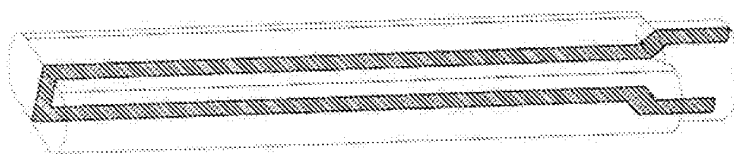


圖15

多孔管實施例-3

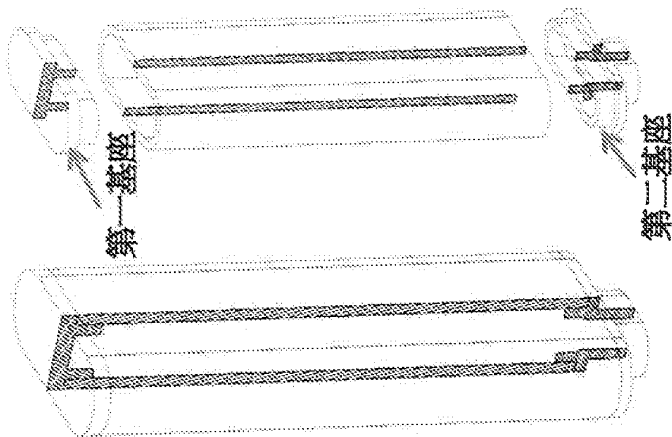


圖14

1. 實施例-3，多孔管的縱長空間的中心軸與充氣閥的中心軸同軸，且耦合結構的貫穿通道的中心軸與充氣閥的中心軸同軸。
2. 實施例-4，多孔管的縱長空間的中心軸與充氣閥的中心軸同軸，且耦合結構的貫穿通道的中心軸與充氣閥的中心軸同軸。

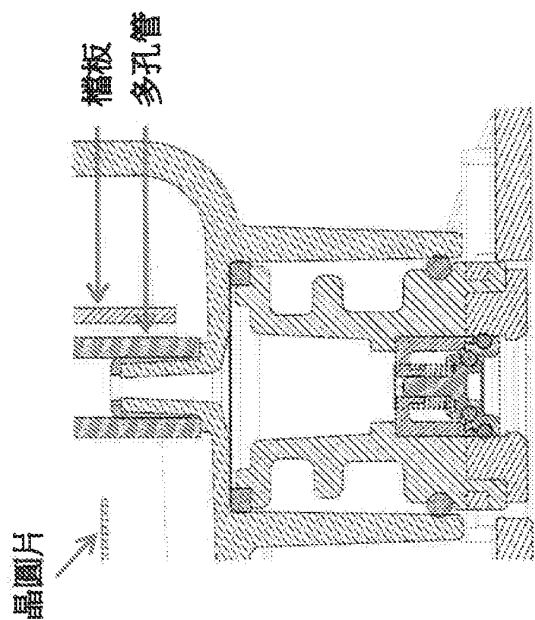


圖16

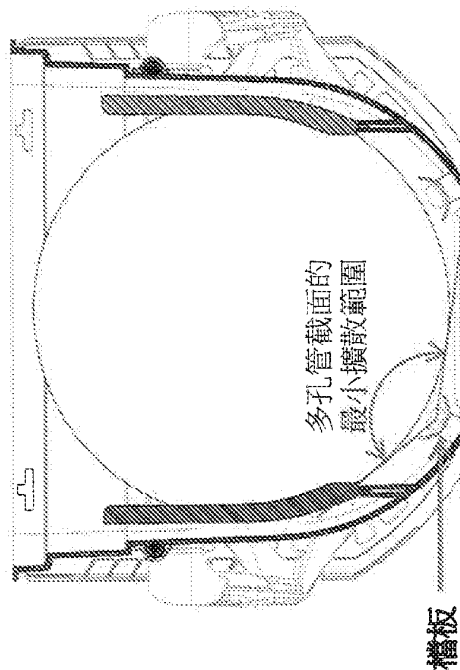


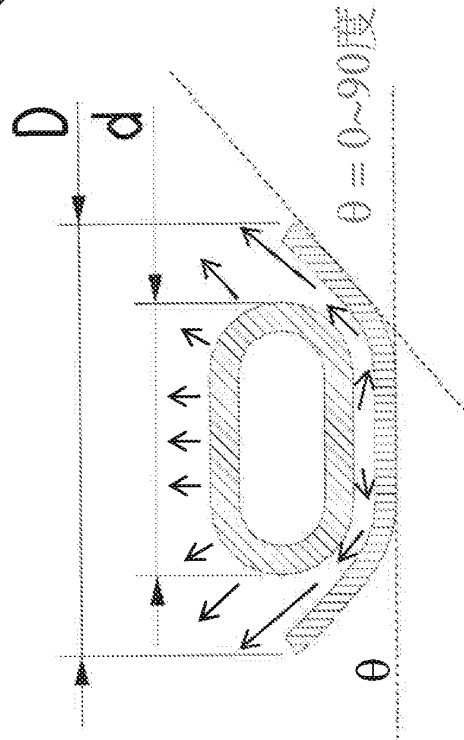
圖17

多孔管截面的最小擴散範圍由多孔管截面中心點與晶圓左、右切線之夾角所界定

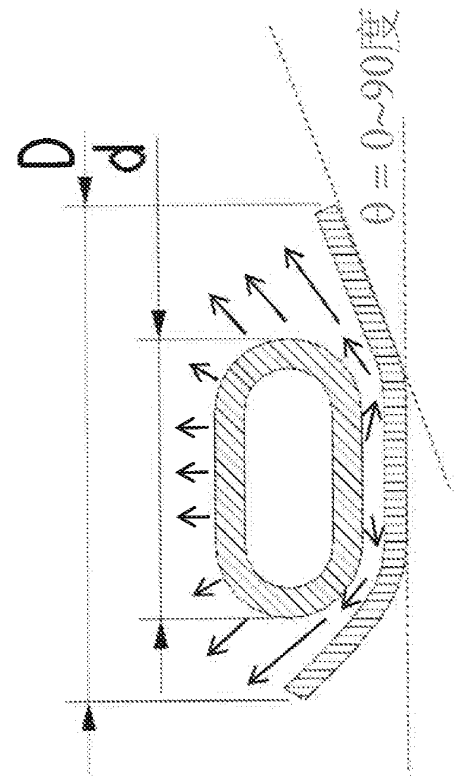
1. 多孔管為360度出氣，可以於多孔管之某一側增加擋板，利用擋板的角度及形狀，來達到控制氣流方向需求之目的。
2. 擋板的高度與多孔管的高度相當，且多孔管與擋板之間形成左側狹縫與右側狹縫。
3. 多孔管與擋板之間的配置可形成左右對稱型(左側狹縫與右側狹縫缺口相同)，或左右不對稱型(左側狹縫與右側狹縫缺口不相同)，如下圖所示。

不同實施例中，多孔管與檔板之截面剖視圖I

◆ $D > d$



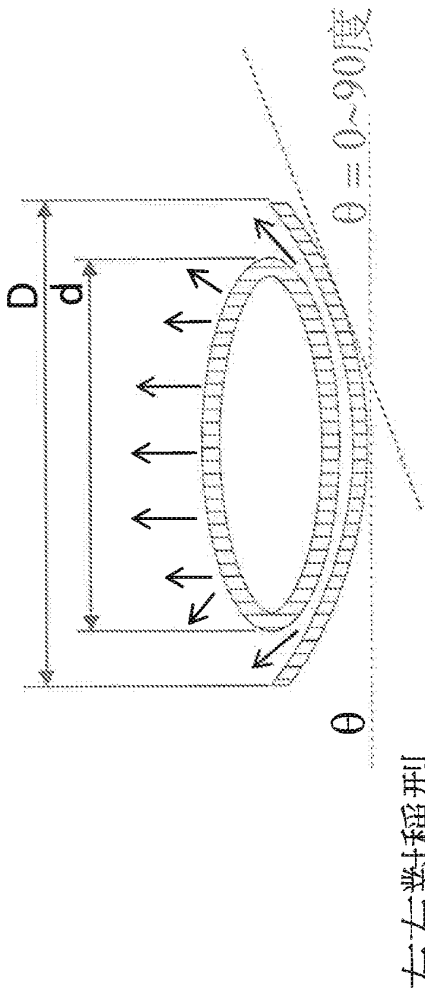
左右對稱型



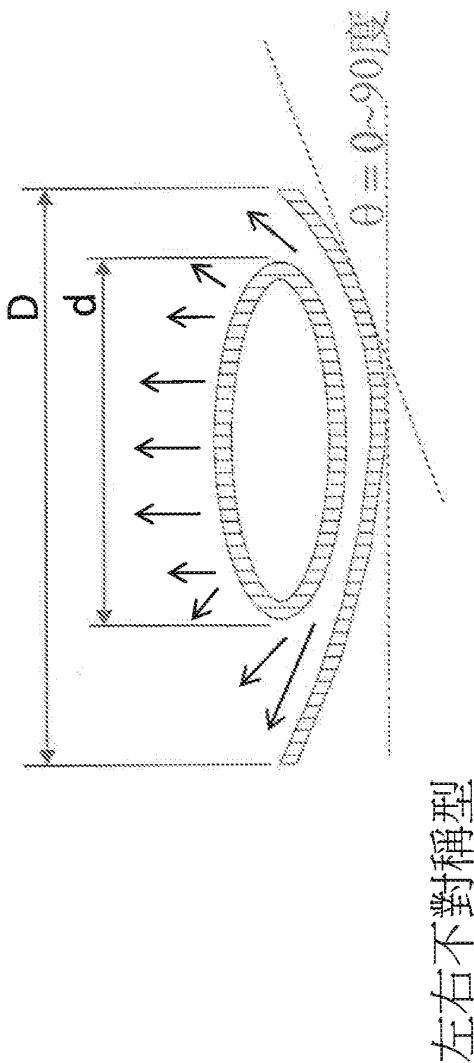
左右不對稱型

不同實施例中，多孔管與檔板之截面剖視圖II

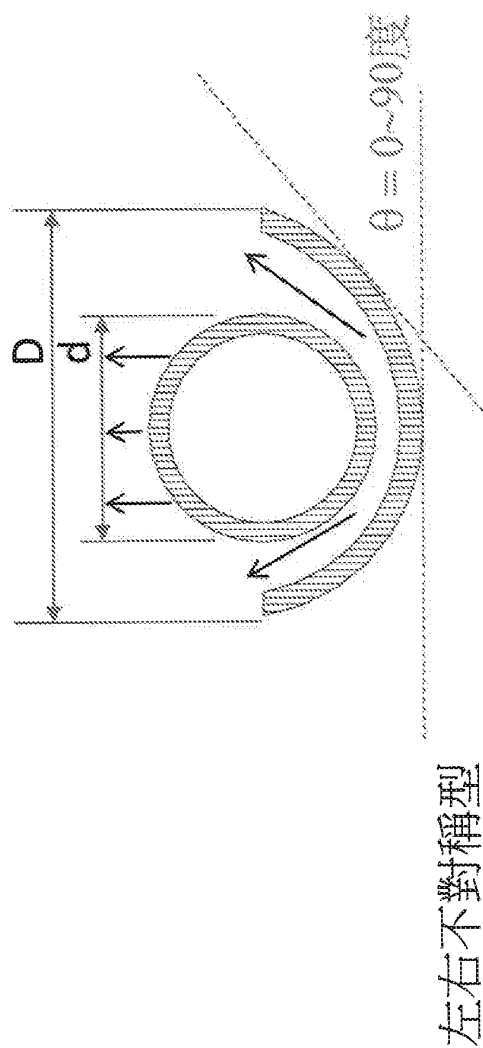
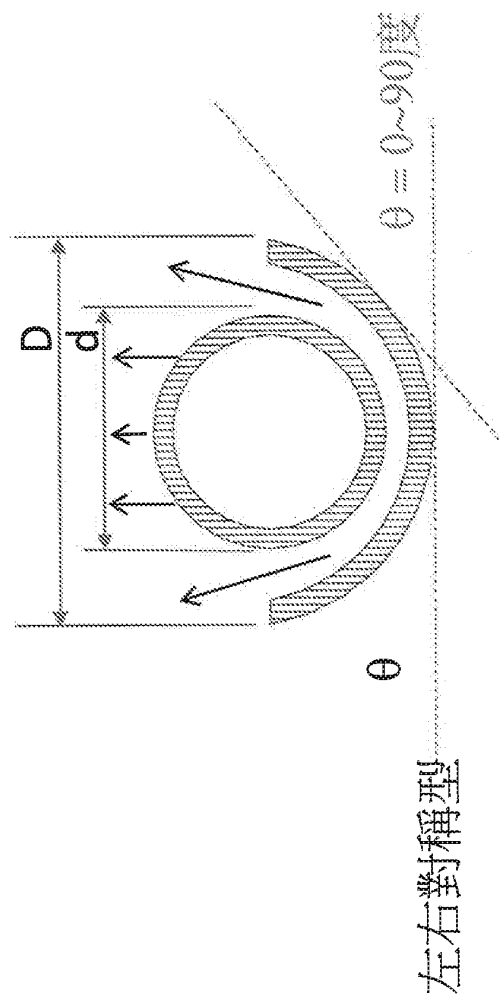
◆ $D > d$



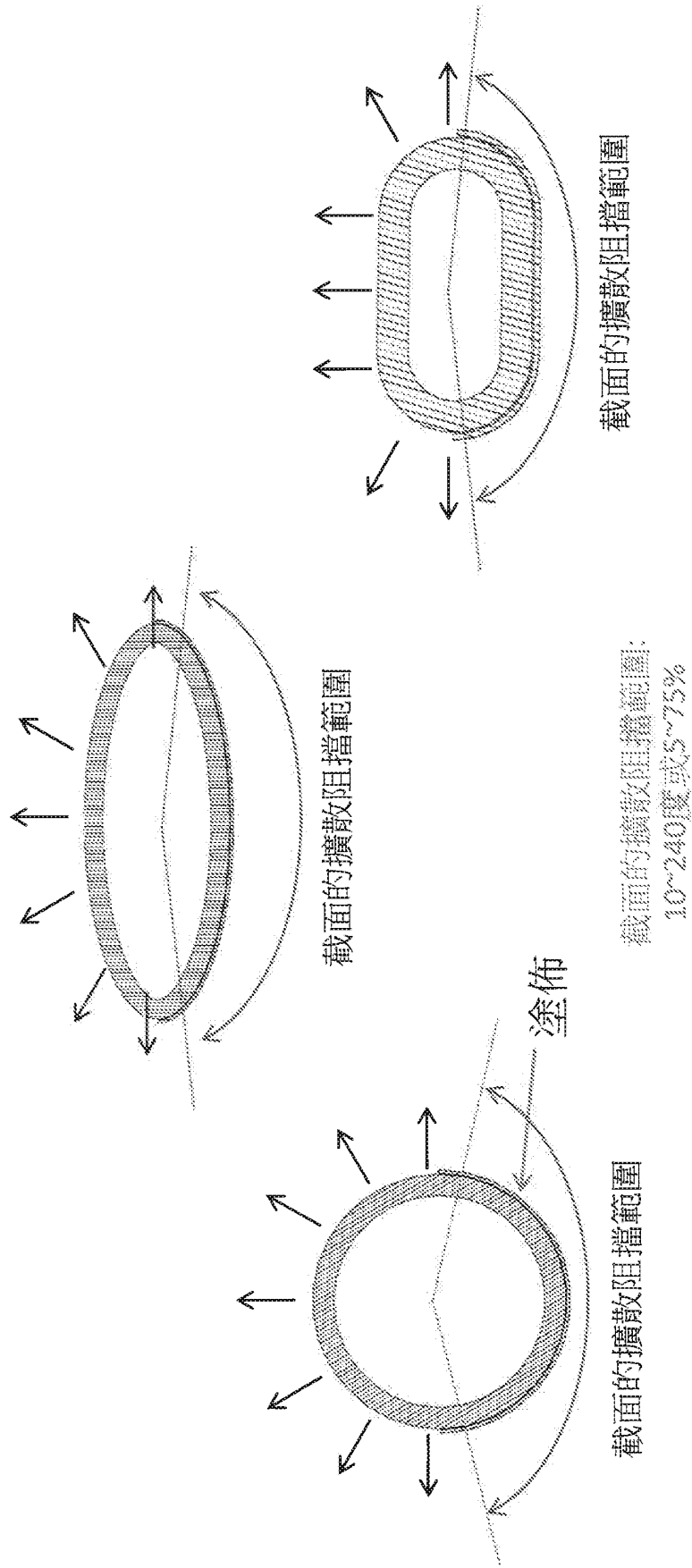
◆ $D > d$



不同實施例中，多孔管與檔板之截面剖視圖III



不同實施例中，具有至少部份表面塗佈之多孔管之截面剖視圖



本發明所欲保護之技術特徵

1. 一種氣體擴充結構配置裝置，安裝於一晶圓容器，該晶圓容器配置至少一充氣閥模組，充氣閥模組界定一具有一中心軸的進氣通道，該氣體擴充結構配置裝置包含：
 - 一耦合結構，設置於該晶圓容器之一底板，該耦合結構界定一具有一中心軸的貫穿通道；以及，一多孔管，具有一縱向空間，該縱向空間具有一中心軸，該多孔管藉由該耦合結構安裝至該晶圓容器之該底板，且該耦合結構的貫穿通道連通該充氣閥模組的進氣通道與該多孔管的縱向空間，其中該進氣通道的中心軸位於該多孔管的縱向空間內，且該進氣通道的中心軸與該縱向空間的中心軸不同軸。
2. 一種氣體擴充結構配置裝置，安裝於一晶圓容器，該晶圓容器配置至少一充氣閥模組，該充氣閥模組界定一具有一中心軸的進氣通道，該氣體擴充結構配置裝置包含：
 - 一耦合結構，設置於該晶圓容器之一底板，該耦合結構界定一具有一中心軸的貫穿通道；以及，一多孔管，具有一縱向空間，該縱向空間具有一中心軸，且該縱向空間的截面具有一長軸，該多孔管藉由該耦合結構安裝至該晶圓容器之該底板，且該耦合結構的貫穿通道連通該充氣閥模組的進氣通道與該多孔管的縱向空間，其中該進氣通道的中心軸與該縱向空間的中心軸同軸，且該縱向空間的截面的長軸通過該縱向空間的中心軸。
3. 一種氣體擴充結構配置裝置，安裝於一晶圓容器，該晶圓容器配置至少一充氣閥模組，該充氣閥模組界定一具有一中心軸的進氣通道，該氣體擴充結構配置裝置包含：
 - 一耦合結構，設置於該晶圓容器之一底板，該耦合結構界定一具有一中心軸的貫穿通道；以及，一多孔管，具有一縱向空間，該縱向空間具有一中心軸，該多孔管藉由該耦合結構安裝至該晶圓容器之該底板，且該耦合結構的貫穿通道連通該充氣閥模組的進氣通道與該多孔管的縱向空間，其中該多孔管與該晶圓容器的一側壁之間設置一檔板，該檔板具有一表面，該表面部分環繞該多孔管，使該多孔管面向該檔板的該表面所排出的氣體，經由該表面改變氣體流向。

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		DIFFUSER FOUN		
First Named Inventor/Applicant Name:		MING-CHIEN CHIU		
Filer:		Tim Tingkang Xia/David Chen		
Attorney Docket Number:		0114970.255US0		
Filed as Small Entity				
Filing Fees for Provisional				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
PROVISIONAL APPLICATION FILING FEE	2005	1	150	150
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				150

Electronic Acknowledgement Receipt	
EFS ID:	43527834
Application Number:	63233878
International Application Number:	
Confirmation Number:	7054
Title of Invention:	DIFFUSER FOUP
First Named Inventor/Applicant Name:	MING-CHIEN CHIU
Customer Number:	21874
Filer:	Tim Tingkang Xia/David Chen
Filer Authorized By:	Tim Tingkang Xia
Attorney Docket Number:	0114970.255US0
Receipt Date:	17-AUG-2021
Filing Date:	
Time Stamp:	12:07:49
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$150
RAM confirmation Number	E20218GC08171471
Deposit Account	121781
Authorized User	David Chen
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37 CFR 1.19 (Document supply fees)					
37 CFR 1.21 (Miscellaneous fees and charges)					
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Fee Worksheet (SB06)	0114970255US0_FeeTrans.pdf	203129	no	1
			375c8186336370ef995d897b2b6d388ca43f6256		
Warnings:					
Information:					
2	Application Data Sheet	0114970255US0_ADS.pdf	1829212	no	9
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Warnings:					
Information:					
3	Power of Attorney	0114970_255US0_POA.pdf	366547	no	2
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4	Provisional Cover Sheet (SB16)	0114970255US0_Trans1.pdf	1304638	no	4
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FEE TRANSMITTAL		Complete if known	
		Application Number	
		Filing Date	August 17, 2021
☒ Applicant asserts small entity status. See 37 CFR 1.27.		First Named Inventor	MING-CHIEN CHIU
☐ Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.		Examiner Name	
		Art Unit	
TOTAL AMOUNT OF PAYMENT	(\$ 150	Practitioner Docket No.	0114970.255US0

METHOD OF PAYMENT (check all that apply)

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☒ Deposit Account Deposit Account Number: 121781 Deposit Account Name: Locke Lord LLP

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FEE CALCULATION**1. BASIC FILING, SEARCH, AND EXAMINATION FEES (U = undiscounted fee; S = small entity fee; M = micro entity fee)**

Application Type	FILING FEES			SEARCH FEES			EXAMINATION FEES			Fees Paid (\$)
	U (\$)	S (\$)	M (\$)	U (\$)	S (\$)	M (\$)	U (\$)	S (\$)	M (\$)	
Utility	320	160*	80	700	350	175	800	400	200	
Design	220	110	55	160	80	40	640	320	160	
Plant	220	110	55	440	220	110	660	330	165	
Reissue	320	160	80	700	350	175	2,320	1,160	580	
Provisional	300	150	75	0	0	0		0	0	150

* The \$150 small entity status filing fee for a utility application is further reduced to \$75 for a small entity status applicant who files the application via EFS-Web.

2. EXCESS CLAIM FEES

Fee Description	Undiscounted Fee (\$)	Small Entity Fee (\$)	Micro Entity Fee (\$)
Each claim over 20 (including Reissues)	100	50	25
Each independent claim over 3 (including Reissues)	480	240	120
Multiple dependent claims	860	430	215

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)	Multiple Dependent Claims	Fee (\$)	Fee Paid (\$)
-20 or HP =	x	=				
HP = highest number of total claims paid for, if greater than 20.						
Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)			
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3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$420 (\$210 for small entity) (\$105 for micro entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
17	- 100 =	/ 50 = (round up to a whole number) x	=	

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Non-English specification, \$140 fee (\$70 for small entity) (\$35 for micro entity)

Non-electronic filing fee under 37 CFR 1.16(t) for a utility application, \$400 fee (\$200 small or micro entity)

Other (e.g., late filing surcharge):

SUBMITTED BY		Registration No.	45242	Telephone	404.870.4698
Signature	/Tim Tingkang Xia/	(Attorney/Agent)			
Name (Print/Type)	Tim Tingkang Xia			Date	August 17, 2021

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	0114970.255US0
		Application Number	
Title of Invention	DIFFUSER FOUP		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

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☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
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Inventor Information:

Inventor	1				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	MING-CHIEN		CHIU			
Residence Information (Select One) US Residency • Non US Residency Active US Military Service						
City	New Taipei		Country of Residence ⁱ	TW		
Mailing Address of Inventor:						
Address 1	9F.-5, No. 2, Sec. 4, Zhongyang Rd.					
Address 2	Tucheng Dist.					
City	New Taipei		State/Province			
Postal Code	236		Country ⁱ	TW		
Inventor	2				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	CHIA-HO		CHUANG			
Residence Information (Select One) US Residency • Non US Residency Active US Military Service						
City	New Taipei		Country of Residence ⁱ	TW		
Mailing Address of Inventor:						
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Postal Code	236		Country ⁱ	TW		
Inventor	3				Remove	
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	0114970.255US0
		Application Number	
Title of Invention	DIFFUSER FOUP		

Prefix	Given Name	Middle Name	Family Name	Suffix
	KUO-HUA		LEE	
Residence Information (Select One) US Residency ☒ Non US Residency Active US Military Service				
City	New Taipei	Country of Residence ⁱ	TW	

Mailing Address of Inventor:

Address 1	9F.-5, No. 2, Sec. 4, Zhongyang Rd.			
Address 2	Tucheng Dist.			
City	New Taipei	State/Province		
Postal Code	236	Country ⁱ	TW	
Inventor	4	Remove		
Legal Name				

Prefix	Given Name	Middle Name	Family Name	Suffix
	SHU-HUNG		LIN	
Residence Information (Select One) US Residency ☒ Non US Residency Active US Military Service				
City	New Taipei	Country of Residence ⁱ	TW	

Mailing Address of Inventor:

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City	New Taipei	State/Province		
Postal Code	236	Country ⁱ	TW	
Inventor	5	Remove		
Legal Name				

Prefix	Given Name	Middle Name	Family Name	Suffix
	HAO-KANG		HSIA	
Residence Information (Select One) US Residency ☒ Non US Residency Active US Military Service				
City	New Taipei	Country of Residence ⁱ	TW	

Mailing Address of Inventor:

Address 1	9F.-5, No. 2, Sec. 4, Zhongyang Rd.			
Address 2	Tucheng Dist.			
City	New Taipei	State/Province		
Postal Code	236	Country ⁱ	TW	

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	0114970.255US0
		Application Number	
Title of Invention	DIFFUSER FOUP		

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button.

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).

☐ An Address is being provided for the correspondence information of this application.

Customer Number	21874		
Email Address	patent@lockelord.com	Add Email	Remove Email

Application Information:

Title of the Invention	DIFFUSER FOUP		
Attorney Docket Number	0114970.255US0	Small Entity Status Claimed	☒
Application Type	Provisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	0114970.255US0
		Application Number	
Title of Invention	DIFFUSER FOUP		
Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	21874		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status		Remove
Application Number	Continuity Type	Prior Application Number
Filing or 371(c) Date (YYYY-MM-DD)		
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.		
		Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

			Remove
Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

- ☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
- NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	0114970.255US0
		Application Number	
Title of Invention	DIFFUSER FOUP		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	0114970.255US0
		Application Number	
Title of Invention	DIFFUSER FOUP		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
Applicant	1		Remove
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.			
		Clear	
☐ Assignee	Legal Representative under 35 U.S.C. 117		Joint Inventor
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor:			
If the Applicant is an Organization check here. ☒			
Organization Name	GUDENG PRECISION INDUSTRIAL CO., LTD.		
Mailing Address Information For Applicant:			
Address 1	9F.-5, No. 2, Sec. 4, Zhongyang Rd.		
Address 2	Tucheng Dist.		
City	New Taipei	State/Province	
Country	TW	Postal Code	236
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button. Add			

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	0114970.255US0
		Application Number	
Title of Invention	DIFFUSER FOUP		

Assignee	1			
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
				Remove
If the Assignee or Non-Applicant Assignee is an Organization check here.				☐
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country ⁱ		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.				Add

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the **INITIAL** filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Tim Tingkang Xia/			Date (YYYY-MM-DD)	2021-08-17
First Name	Tim Tingkang	Last Name	Xia	Registration Number	45242
Additional Signature may be generated within this form by selecting the Add button.				Add	

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	0114970.255US0
		Application Number	
Title of Invention	DIFFUSER FOUP		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.