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(54) **Compression-moulded combination fireworks.**

(57) The disclosure discloses a compression-moulded combination fireworks, including a number of parallel tubular cavities uniformly disposed in a main body. The upper ports of the tubular cavities are open and the lower ports of the tubular cavities are sealed. Drugs for launching fireworks and effect members are accommodated in the tubular cavities. The sealed ends of the tubular cavities are provided with igniting holes penetrating the bottom of the main body and the bottom openings of the igniting holes are located in a fuse groove. A cut-off groove is set between the bottom openings of the igniting holes in the fuse groove and the fuse groove is sealed by glue. The glue is enabled to form a closed ring easily along the direction of the cross section of fuse in the fuse groove to cut off the passages through which gunpowder gases advance along the gaps to eliminate flame propagation. At the same time, all paths that allow high[-]pressure burning gunpowder gases to burst out of the igniting holes to cause accidents are blocked, and the gunpowder gases in all tubular cavities are restrained and can only burst out from the openings of the upper ends of the tubular cavities, thus ensuring the safety of the product, normalizing the use amount of the gunpowder and improving the blast-off quality.

NL C 2010763

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.

Compression-moulded combination fireworks

Field of the Invention

The disclosure relates to an entertainment fireworks product, and more particularly
5 to a kind of combination fireworks.

Background of the invention

According to the definitions of normative documents including national standards
GB10631-2004 *Fireworks and Firecracker Safety and Quality* and GB19593-2004
10 *Fireworks and Firecracker Combination Fireworks* of the People's Republic of China,
combination fireworks are fireworks products combined by multiple single tubes. A
single tube is called a shot. Traditional combination fireworks are assembled by
multiple paper tubes with various processes, low production efficiency, and low
product standards etc.

15 In recent years, our company has developed a kind of one-step integrally-formed
combination fireworks moulded by paste. A finished fireworks body has a similar shape
and structure with traditional combination fireworks. Generally, the overall appearance
of the main body of the finished fireworks body is shaped as a rounded-corner prism or
a cylinder etc. Several parallel tubular cavities are uniformly distributed on the main
20 body. The structures and functions of the tubular cavities are similar to those of the
single tubes of traditional fireworks. The upper ports of the tubular cavities are open
and the lower ports of the tubular cavities are sealed. Drugs for launching fireworks and
effect members are accommodated in the tubular cavities. The igniting mode, which
applies a bottom fuse igniting structure, is different from the lateral fuse igniting
25 structure of traditional combination fireworks. The sealed ends of the tubular cavities
are provided with igniting holes penetrating the bottom of the main body and the
bottom is provided with a fuse groove that connects the bottom openings of the igniting
holes to protect and locate a fuse. The fuse is embedded in the fuse groove and
connected to each igniting hole to ignite the drugs for launching fireworks through the
30 igniting holes. For the manufacture technique, please refer to Chinese patent whose
authorized publication number is CN 101377395B, entitled *Compression-moulded
Fireworks External Tube, Display Shell Spherical Casing and Manufacture Thereof*
published on April 11th, 2012.

However, it's found in practice that this kind of one-step integrally-formed combination fireworks still has some disadvantages, especially flame propagation which is caused easily, i.e. the gunpowder and effect member in each tubular cavity are not ignited and launched in turn by the fuse according to the blast-off procedure.

5 Instead, two or more tubular cavities are launched almost at the same time, which completely damages the blast-off effect.

Summary of the invention

To solve the disadvantages above, the technical problem to be solved by the disclosure is to provide a compression-moulded combination fireworks to effectively prevent flame propagation and ensure successful implementation of the designed blast-off effect. To solve the technical problem above, the disclosure applies the following technical solution: a compression-moulded combination fireworks, including a number of parallel tubular cavities uniformly disposed in a main body. The upper ports of the tubular cavities are open and the lower ports of the tubular cavities are sealed. Drugs for launching fireworks and effect members are accommodated in the tubular cavities. The sealed ends of the tubular cavities are provided with igniting holes penetrating the bottom of the main body, and the bottom openings of the igniting holes are located in a fuse groove. A cut-off groove is set between the bottom openings of the igniting holes

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in the fuse groove and the fuse groove is sealed by glue.

It is found in our studies that flame propagation is caused by the following reasons: after the fuse is embedded into the fuse groove, there are gaps between the side walls and the bottoms of the fuse and the fuse groove. The continuous gaps within a section of the fuse groove may cause flame propagation between the igniting holes in the gaps. Since the advancing speed of burning high-pressure gunpowder gases along the fuse groove is higher than the burning speed of the fuse, the gunpowder gases enter the igniting holes through the gaps to ignite the launching gunpowder and the effect members in the tubular cavities disorderly.

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The fuse groove is sealed by the glue to reduce flame propagation. The glue may apply commercial products from various markets of fireworks materials, e.g. moisture barrier etc. In order to improve the flame blocking performance and provide better flow distribution and adhesion performance, the components of the glue preferably include: based on parts by weight, 1 to 2 parts of moisture barrier and 2 to 4 parts of calcium-

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magnesium powder mixed uniformly according to a conventional method.

However, since the glue distribution can be hardly matched with the gaps completely, and there may still be gaps, especially those between the fuse and the bottom of the fuse groove. Therefore, a cut-off groove deeper than the fuse groove is further set in the fuse groove and is set between the bottom openings of the igniting holes, so that the glue is enabled to form a closed ring easily along the direction of the cross section of the fuse in the fuse groove to cut off the passages through which gunpowder gases advance along the gaps to eliminate flame propagation. At the same time, all paths that allow the high-pressure burning gunpowder gases to burst out of the igniting holes to cause accidents are blocked, and the gunpowder gases in all tubular cavities are restrained and can only burst out from the openings of the upper ends of the tubular cavities, thus effectively avoiding loss of launching energy, ensuring the safety of the product, normalizing the use amount of the gunpowder and improving the blast-off quality.

It can be learned from the analysis above that the cut-off groove may be set integrally (for example, set in a U shape along the cross section of the inner cavity wall of the fuse groove) or partially (for example, set along a certain part of the cross section of the inner cavity wall of the fuse groove). The length, width and depth of the cut-off groove may be adjusted according to actual conditions. However, combining the cut-off performance and the requirements of the manufacture techniques, the cut-off groove is preferably set at the bottoms of the inner cavities of the fuse groove. Preferably, the width of the cut-off groove is greater than the width of the fuse groove. Preferably, the cut-off groove is rectangular blind hole.

Preferably, the sealed end of each of the tubular cavities is provided with an igniting hole penetrating the bottom of the main body. The fuse groove is a continuous integral groove and the bottom opening of each igniting hole is located in the integral groove. The cut-off groove is located between the bottom openings. In use, it only needs to embed a complete fuse in the fuse groove to satisfy the igniting requirements. It is unnecessary to insert a fuse in each igniting hole separately. The burning gas spark generated by the combustion of the fuse in the fuse groove enters the tubular cavities via the igniting holes to ignite the launching gunpowder and the effect members.

Since the bottom of the main body of some products is relatively thick, the igniting holes are relatively long in the axial direction, after the fuse is ignited, the fuse

spark is not high enough to reach the launching gunpowder through the igniting holes, and the launching gunpowder in the tubular cavities cannot be ignited to severely influence the blast-off effect. In order to avoid the situation above, the igniting hole is preferably taper hole with a cone node in the bottom direction of the main body and
5 with a cone bottom in the bottom direction of the tubular cavity, so that the launching gunpowder can fall along the funnel-shaped taper hole to be closer to the fuse to enable the spark of the ignited fuse to completely contact the launching gunpowder and ensure that there will be no ignition failure.

Preferably, the corners of the continuous integral groove are set as circular arc
10 corners, thus reducing the folding of the fuse at the corners, preventing abrasion or rupture of the fuse during folding and avoiding quality problem of the product caused by fuse rupture.

Preferably, the sealed end of each of the tubular cavities is provided two igniting
holes penetrating the bottom of the main body, one of which is a fuse inlet hole and the
15 other one is a fuse outlet hole. The fuse groove includes multiple distributed grooves set at intervals. In all the igniting holes, excepting the fuse inlet hole connected to an igniting fuse and the fuse outlet hole connected to a backup igniting fuse, the bottom openings of a fuse inlet hole of a tubular cavity and the fuse outlet hole of another
neighboring tubular cavity are located in a same distributed groove. The cut-off groove
20 is located between the two bottom openings. In use, multiple fuses are prepared according to the number of the distributed grooves and it only needs to insert the two ends of each fuse into the fuse inlet and the fuse outlet in the groove.

Preferably, the periphery of the bottom of the main body is provided with a frame
formed by lug bosses. A plurality of slots for ventilation and pressure relief set on the
25 frame. The frame formed by the lug bosses lifts the bottom of the main body of the combination fireworks off the ground to prevent moisture and damage. At the same time, the slot for ventilation and pressure relief ventilates the bottom to speed up the drying process of the product on one hand. On the other hand, the gas pressure can be released timely in the case that the gunpowder gases leak from the bottom of the
30 fireworks, avoiding toppling of the combination fireworks to prevent more serious accidents.

The disclosure will be further described below in combination with the accompanying drawings and embodiments.

Brief description of the drawings

Fig. 1 is a schematic diagram illustrating an external integral view of the first embodiment;

5 Fig. 2 is a structural diagram illustrating the bottom of a main body of the first embodiment;

Fig. 3 is a schematic diagram illustrating a sectional structure of the first embodiment;

10 Fig. 4 is a structural diagram illustrating the bottom of a main body of the second embodiment;

Fig. 5 is a schematic diagram illustrating a sectional structure of the second embodiment (without fuse and glue);

Fig. 6 is a schematic diagram illustrating a sectional structure of the second embodiment (with fuse and glue);

15 Fig. 7 is a schematic diagram illustrating an external integral view of the third embodiment;

Fig. 8 is a structural diagram illustrating the bottom of a main body of the third embodiment; and

20 Fig. 9 is a schematic diagram illustrating the bottom of a main body of the fourth embodiment.

Detailed description of the embodiments

Embodiment 1: Fig. 1 to Fig. 3 show a specific structure of the disclosure, which is a kind of 88-shot combination fireworks integrally moulded through compression in one step. The compression-moulded combination fireworks include: 88 parallel tubular
25 cavities 2 uniformly distributed on a main body 1. The upper ports 3 of the tubular cavities 2 are open and the lower ports 4 of the tubular cavities are sealed. Drugs for launching fireworks and effect members are accommodated in the tubular cavities 2. The sealed ends of the tubular cavities 2 are provided with igniting holes 5 penetrating
30 the bottom of the main body 1 and the bottom openings 6 of the igniting holes 5 are located in a fuse groove 7. A cut-off groove 8 is set between the bottom openings 6 of the igniting holes 5 in the fuse groove 7 and the fuse groove 7 is installed with a fuse 10 and sealed by glue 9. The components of the glue are: based on parts by weight, 1.2

parts of moisture barrier and 3 parts of calcium-magnesium powder mixed uniformly according to a conventional method. The cut-off groove 8 is set at the bottom of the inner cavity of the fuse groove 7. The cut-off groove 8 is rectangular blind hole whose width is larger than the width of the fuse groove 7. The periphery of the bottom of the main body 1 is provided with a frame 12 formed by lug bosses and six slots for ventilation and pressure relief 13 are set on the frame 12.

In the present embodiment, each tubular cavity 2 is provided with an igniting hole 5, as shown in Fig. 2. The fuse groove 7 is a continuous integral groove and the corners 11 thereof are set as circular arc corners. The bottom openings 6 of the 88 igniting holes 5 are located in the fuse groove 7. The cut-off groove 8 is located between the bottom openings 6. In use, it only needs to embed a complete fuse 10 in the fuse groove 7. The two ends of the fuse 10 are guided out to the top surface of the main body 1 through the lateral fuse grooves 14 of the main body 1 to function as an igniting fuse and a backup igniting fuse respectively. The igniting hole 5 is a taper hole with a conic node in the bottom direction of the main body 1 and with a cone bottom in the internal bottom direction of the tubular cavity 2.

It can be seen that the cut-off groove 8 is set between the bottom openings 6 of two igniting holes 5 to enable the glue 9 to form a closed ring easily along the direction of the cross section of the fuse 10 in the fuse groove 7 to cut off the passages through which gunpowder gases advance along the gaps.

Embodiment 2: Fig. 4 to Fig. 6 show another specific structure of the disclosure, which is a kind of 25-shot combination fireworks integrally moulded through compression in one step. Similarly, the compression-moulded combination fireworks include: 25 parallel tubular cavities 102 uniformly distributed on a main body 101. The upper ports of the tubular cavities 102 are open and the lower ports of the tubular cavities are sealed. Drugs for launching fireworks and effect members are accommodated in the tubular cavities 102. The sealed ends of the tubular cavities 102 are provided with igniting holes 105 penetrating the bottom of the main body 101 and the bottom openings of the igniting holes 105 are located in a fuse groove 103. A cut-off groove 104 is set between the bottom openings of the igniting holes 105 in the fuse groove 103 and the fuse groove 104 is installed with a fuse 106 and sealed by glue. The cut-off groove 104 is set at the bottom of the inner cavity of the fuse groove 103. The cut-off groove 104 is rectangular blind hole. The periphery of the bottom of the main

body 101 are set with a frame 107 formed by lug bosses and four slots for ventilation and pressure relief 108 are set on the frame 107.

The difference is that, in the present embodiment, each tubular cavity 102 is provided with two igniting holes 105, one of which is a fuse inlet hole and the other one is a fuse outlet hole. The fuse groove 104 comprises 24 distributed grooves set at intervals. It can be seen from Fig. 4 that there are 50 igniting holes 105 in total. Excepting the fuse inlet hole 109 connected with an igniting fuse and the fuse outlet hole 110 connected with a backup igniting fuse, the other 48 igniting holes are paired into 24 groups, with a fuse inlet hole and a fuse outlet hole in each group, i.e. a fuse inlet hole of a tubular cavity 102 and a fuse outlet hole of another neighboring tubular cavity 102 are paired. Two bottom openings of the igniting holes 105 in each group are located in a same fuse groove 103. The cut-off groove 104 is set between the two bottom openings. In use, multiple fuse 106 are prepared according to the number of the distributed grooves. The two ends of each fuse 106 are inserted into the fuse inlet hole and the fuse outlet hole in the groove, respectively. The ignition sequence after ignition is the igniting fuse, the fuse inlet hole 109, the launching gunpowder in the tubular cavity in which the fuse inlet hole 109 locates, the fuse outlet hole of the tubular cavity in which the fuse inlet hole 109 locates, the fuse inlet hole of the neighboring tubular cavity in turn, and the ignition is performed in such an order until the fuse outlet hole 110 and the backup igniting fuse are ignited. A reverse order is applied when the backup fuse is ignited.

It can be seen that the cut-off groove 104 is set between the bottom openings of two igniting holes 105 to enable the glue to form a closed ring easily along the direction of the cross section of the fuse 106 in the fuse groove 103 to cut off the passages through which gunpowder gases advance along the gaps.

Embodiment 3: as shown in Fig. 7 and Fig. 8, what's different from the second embodiment is that the present embodiment is a kind of 19-shot combination fireworks integrally moulded through compression in one step. The main body 201 is shaped as a regular hexagon. The cut-off groove 202 is set in a similar manner to enable the glue to form a closed ring easily along the direction of the cross section of the fuse in the fuse groove 203 to cut off the passages through which gunpowder gases advance along the gaps.

Embodiment 4: similarly, Fig. 9 shows a 25-shot combination fireworks integrally

moulded through compression in one step. What's different from the second embodiment is that one of the tubular cavities provided with 3 igniting holes and the other one of the tubular cavities is provided with only 1 igniting hole to form different ignition sequences to satisfy the requirements of the design of the blast-off process to realize a special "volley" effect. However, cut-off groove is set in the fuse groove similarly to enable the glue to form a closed ring easily along the direction of the cross section of the fuse in the fuse groove to cut off the passages through which gunpowder gases advance along the gaps.

The above embodiments described in the disclosure are only used for illustrating the technical solution of the disclosure clearly and should be understood as any limitations to the disclosure. The disclosure has various known replacements and transformations, such as main body shapes, settings of ignition or distribution of fuse grooves etc. and they shall fall into the protection scope of the disclosure without departing from the substantial meaning of the disclosure.

CONCLUSIES

1. Persgevormd samengesteld vuurwerk, omvattende een aantal
evenwijdige buisvormige holtes die uniform zijn aangebracht in een hoofdlichaam,
5 waarbij de bovenste poorten van de buisvormige holtes open zijn en de onderste
poorten van de buisvormige holtes afgedicht zijn; chemicaliën voor lanceren van
vuurwerk en effectonderdelen zijn aangebracht in de buisvormige holtes; de afgedichte
uiteinden van de buisvormige holtes voorzien zijn van ontstekingsgaten die de bodem
van het hoofdlichaam doordringen, en de bodemopeningen van de ontstekingsgaten
10 geplaatst zijn in een lontgroef, waarbij een afsnijdgroef is voorzien tussen de
bodemopeningen van de ontstekingsgaten in de lontgroef en de lontgroef is afgedicht
door lijm.
2. Persgevormd samengesteld vuurwerk volgens conclusie 1, waarbij de
15 afsnijdgroef is voorzien bij de bodem van de binnenholte van de lontgroef.
3. Persgevormd samengesteld vuurwerk volgens conclusie 2, waarbij de
breedte van de afsnijdgroef groter is dan de breedte van de lontgroef.
- 20 4. Persgevormd samengesteld vuurwerk volgens conclusie 2 of
conclusie 3, waarbij de afsnijdgroef een rechthoekig blindgat is.
- 25 5. Persgevormd samengesteld vuurwerk volgens conclusie 1, waarbij the
periferie van de bodem van het hoofdlichaam is voorzien van een frame gevormd door
uitsteekknobbels en een aantal sleuven voor ventilatie en drukontlasting aanwezig zijn
op het frame.
- 30 6. Persgevormd samengesteld vuurwerk volgens conclusie 1, waarbij de
componenten van de lijm omvatten: gebaseerd op gewichtsdelen, 1 tot 2 delen
dampbarrière en 2 tot 4 delen calcium-magnesiumpoeder.
7. Persgevormd samengesteld vuurwerk volgens één of meer van de
conclusies 1, 2, 3, 5 en 6, waarbij het afgedichte uiteinde van de buisvormige holtes is

voorzien van een ontstekingsgat dat de bodem van het hoofdlichaam doordringt; de lontgroef een continue integrale groef is en de bodemopening van elk van de ontstekingsgaten geplaatst is in de integrale groef; en de afsnijdgroef is geplaatst tussen de bodemopeningen.

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8. Persgevormd samengesteld vuurwerk volgens conclusie 7, waarbij het ontstekingsgat een toelopend gat is met een conisch knooppunt in de bodemrichting van het hoofdlichaam en met een conische bodem in de inwendige bodemrichting van de buisvormige holte.

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9. Persgevormd samengesteld vuurwerk volgens conclusie 7, waarbij de hoeken van de continue integrale groef cirkelvormige booghoeken zijn.

10. Persgevormd samengesteld vuurwerk volgens één of meer van de conclusies 1, 2, 3, 5 en 6, waarbij het afgedichte uiteinde van elk van de buisvormige holtes is voorzien van twee ontstekingsgaten die de bodem van het hoofdlichaam doordringen, waarbij de één een lontintreegat en de andere een lontuittreegat is; de lontgroef een aantal op intervallen verdeelde groeven omvat; van alle ontstekingsgaten, uitgezonderd het lontintreegat verbonden met een ontstekingslont en het lontuittreegat verbonden met een reserve-ontstekingslont, de bodemopeningen van een lontintreegat van een buisvormige holte en het lontuittreegat van een andere naburige buisvormige holte zijn geplaatst in een zelfde verdeelde groef; en de afsnijdgroef is geplaatst tussen de twee bodemopeningen.

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Fig. 1

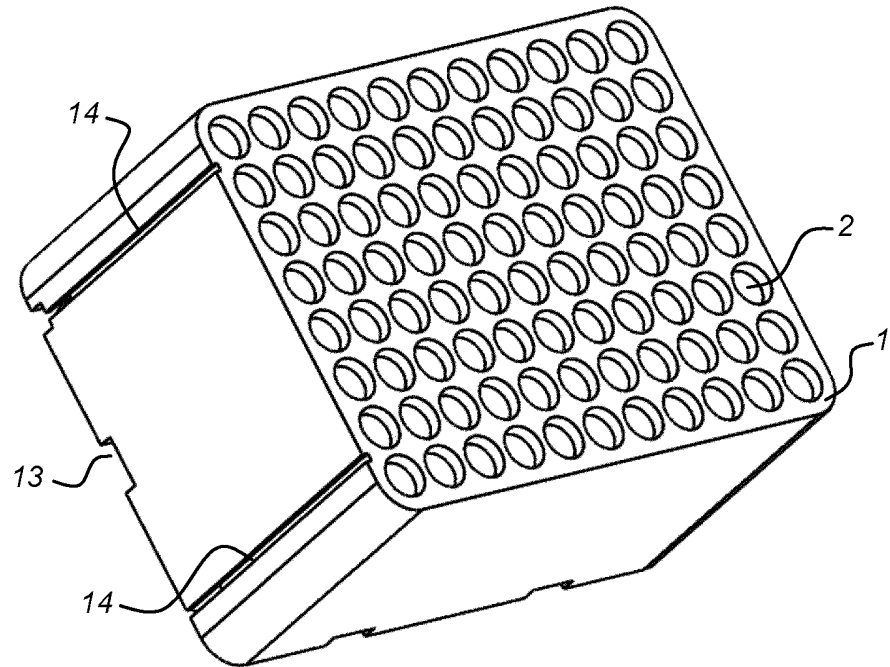


Fig. 2

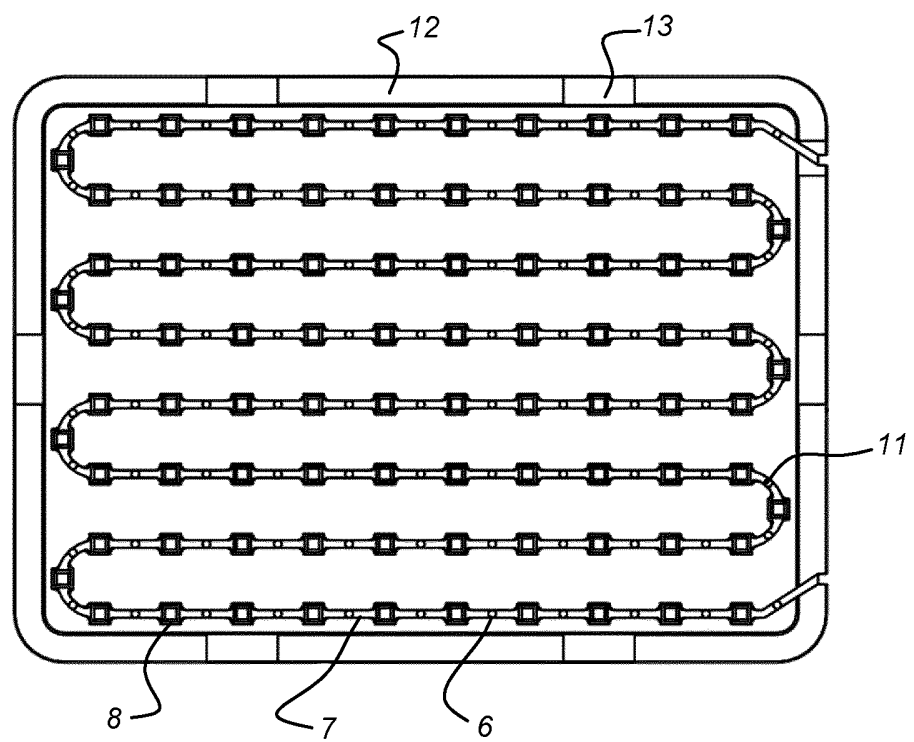


Fig. 3

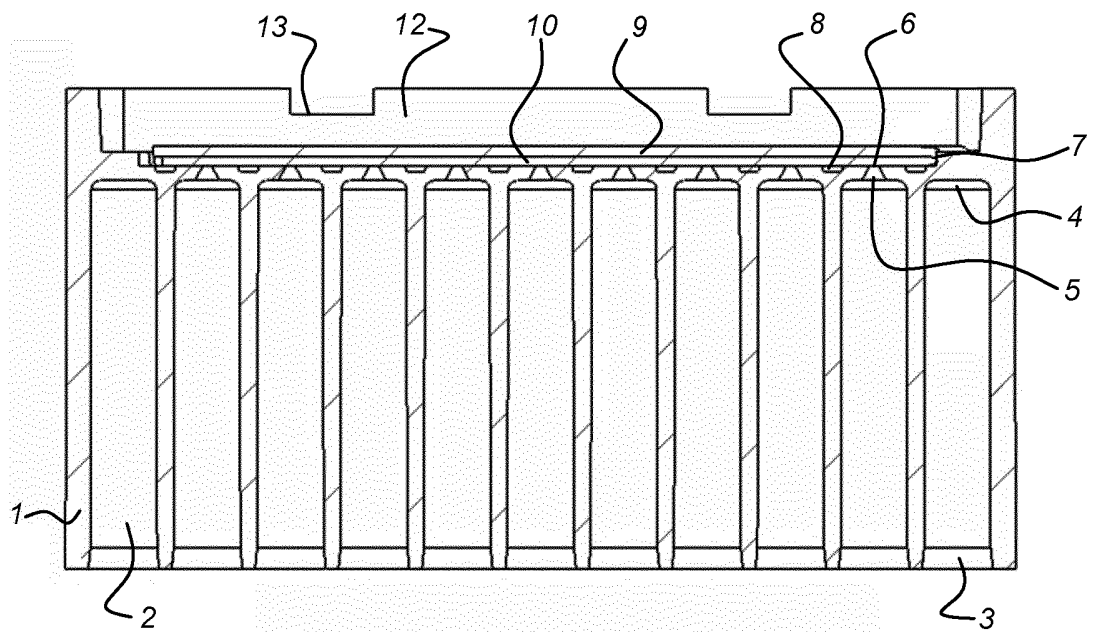


Fig. 4

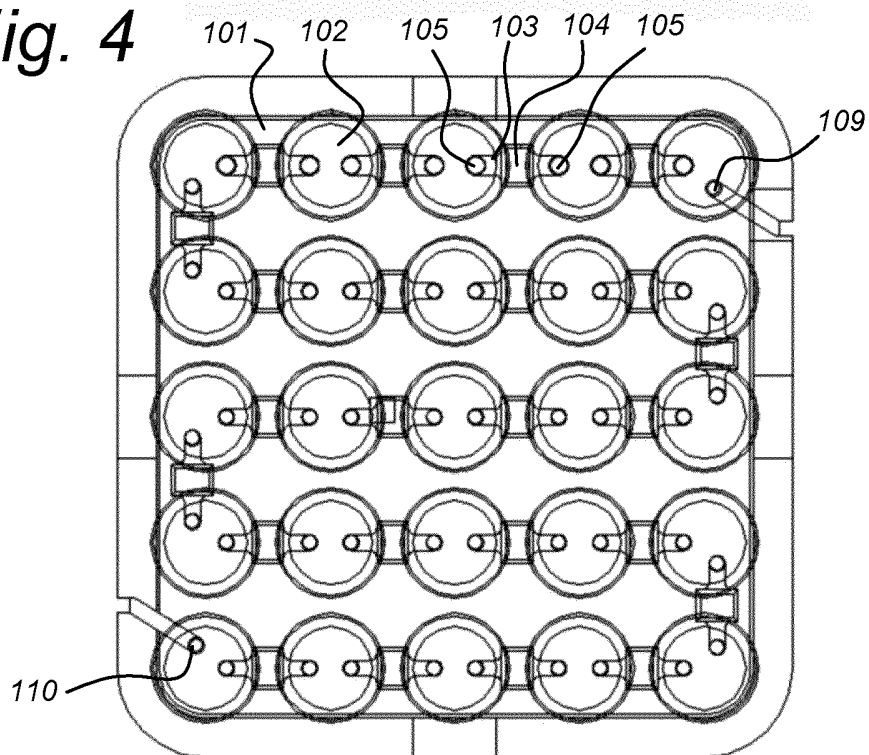


Fig. 5

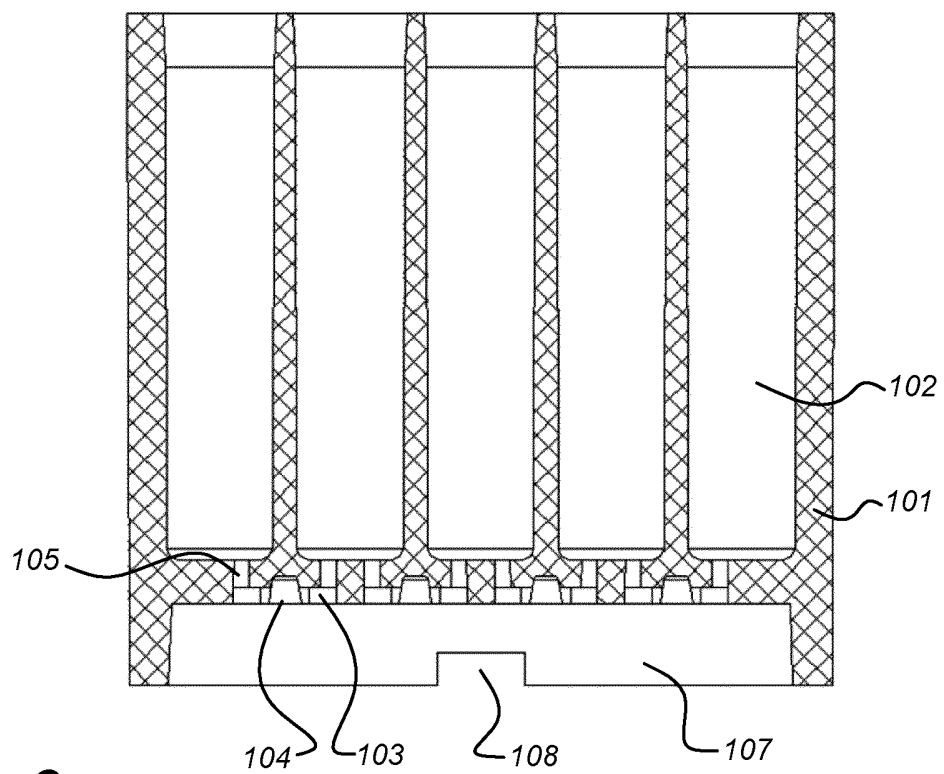


Fig. 6

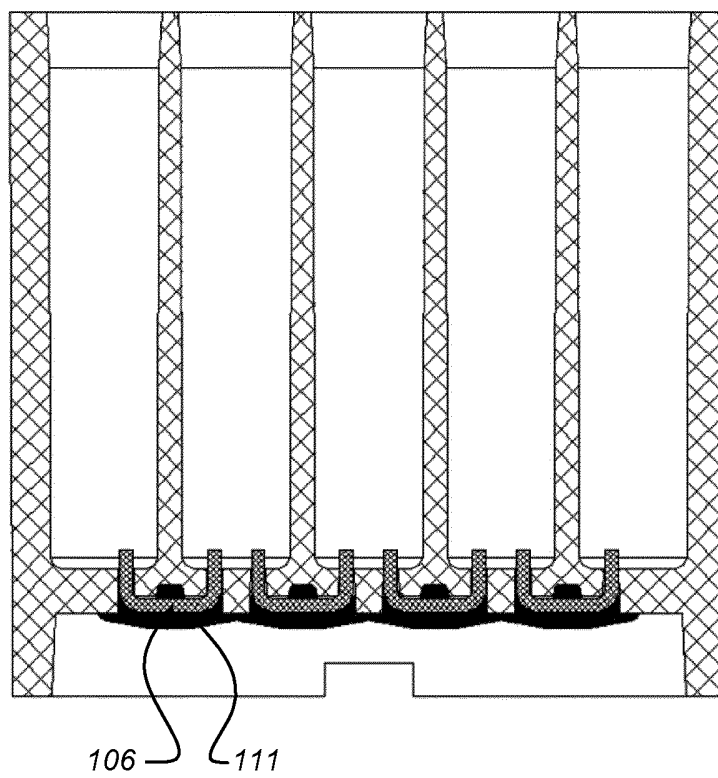


Fig. 7

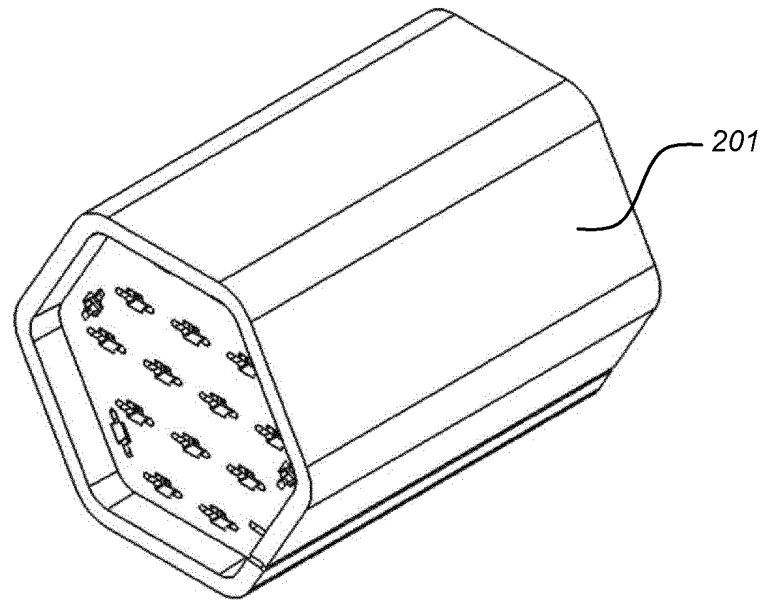


Fig. 8

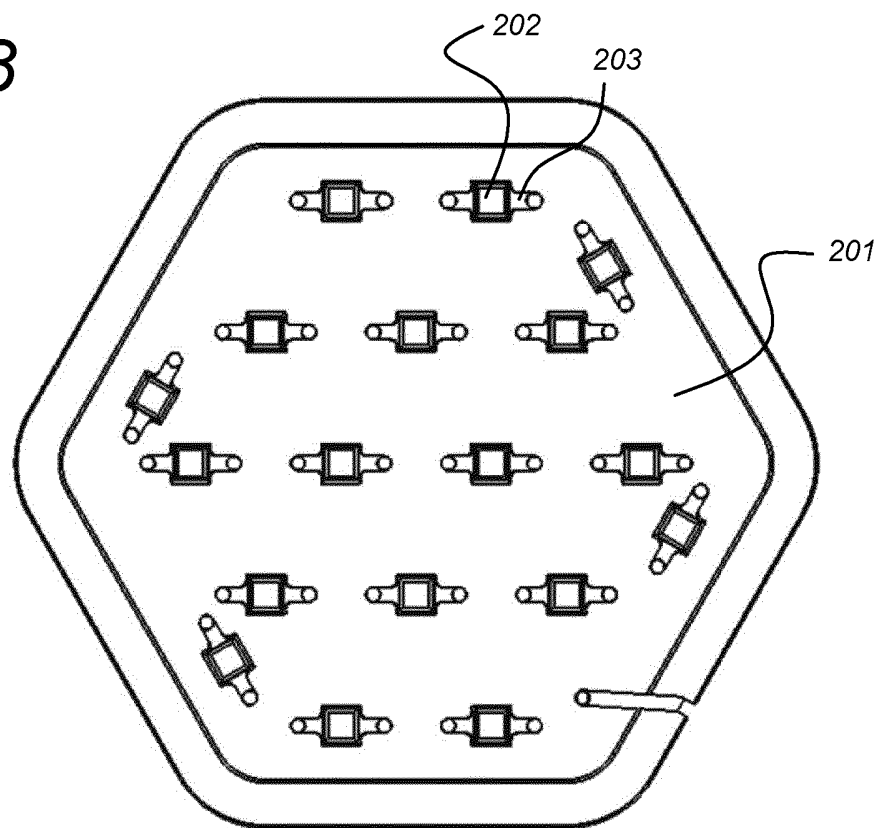
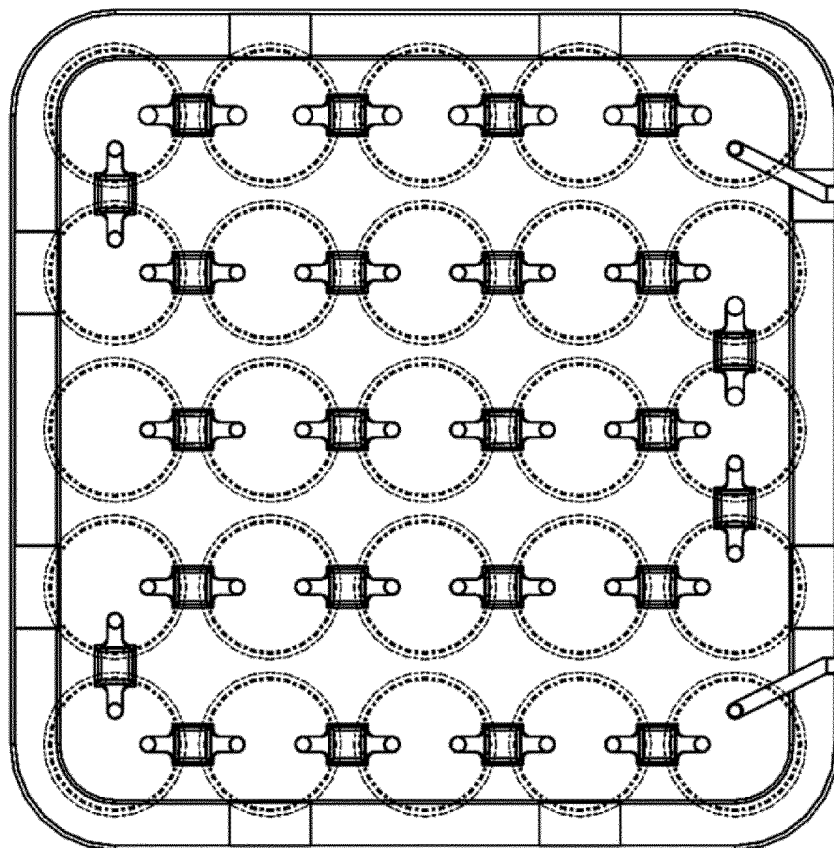


Fig. 9





RAPPORT BETREFFENDE HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK

Octrooiaanvraag 2010763

Classificatie van het onderwerp ¹ : F42B 4/02	Onderzochte gebieden van de techniek ¹ : F42B
Computerbestanden: EPODOC, WPI	Omvang van het onderzoek: Volledig
Datum van de onderzochte conclusies:	Niet onderzochte conclusies:

Van belang zijnde literatuur

Categorie ²	Vermelding van literatuur met aanduiding, voor zover nodig, van speciaal van belang zijnde tekstgedeelten of figuren.	Van belang voor conclusie(s) nr.:
X	FR 2 715 998 A (H. Tustes e.a.) 11 augustus 1995	1 – 3, 7, 8
Y	* bladz. 6, r. 17 – 30; figuur 5 * ---	5, 9, 10
Y	EP 2 498 044 A (K.T.F. Wu) 12 september 2012 * gehele document * ---	5, 10
Y	EP 2 278 256 A (Ziyong Zong e.a.) 26 januari 2011 * gehele document * -----	9, 10
Datum waarop het onderzoek werd voltooid: 16 juli 2014		De bevoegde ambtenaar: ir A.A.M. Bexkens Octrooiencentrum Nederland

¹ Gedefinieerd volgens International Patent Classification (IPC).

² Verklaring van de categorie-aanduiding: zie apart blad.

Categorie van de vermelde literatuur:

- X: op zichzelf van bijzonder belang zijnde stand van de techniek
- Y: in samenhang met andere geciteerde literatuur van bijzonder belang zijnde stand van de techniek
- A: niet tot de categorie X of Y behorende van belang zijnde stand van de techniek
- O: verwijzend naar niet op schrift gestelde stand van de techniek
- P: literatuur gepubliceerd tussen voorrang- en indieningsdatum
- T: niet tijdig gepubliceerde literatuur over theorie of principe ten grondslag liggend aan de uitvinding
- E: octrooiliteratuur gepubliceerd op of na de indieningsdatum van de onderhavige aanvraag en waarvan de indieningsdatum of de voorrangdatum ligt voor de indieningsdatum van de onderhavige aanvraag.
- D: in de aanvraag genoemd
- L: om andere redenen vermelde literatuur
- &: lid van dezelfde octrooifamilie; corresponderende literatuur

AANHANGSEL BEHORENDE BIJ HET RAPPORT BETREFFENDE HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK, UITGEVOERD IN OCTROOIAANVRAGE NR. 2010763

Het aanhangsel bevat een opgave van elders gepubliceerde octrooiaanvragen of octrooien (zogenaaude leden van dezelfde octrooifamilie), die overeenkomen met octrooigeschriften genoemd in het rapport. De opgave is samengesteld aan de hand van gegevens uit het computerbestand van het Europees Octrooibureau per 23 juli 2014

De juistheid en volledigheid van deze opgave wordt noch door het Europees Octrooibureau, noch door NL Octrooicentrum gegarandeerd; de gegevens worden verstrekt voor informatiedoeleinden.

In het rapport genoemd octrooi- geschrift		datum van publicatie	overeenkomend(e) geschrift(en)		datum van publicatie
FR 2715998	A	11-08-1995	(Geen)		
EP 2498044	A	12-09-2012	CN 102679819	A	19-09-2012
EP 2278256	A	26-01-2011	CN 101709937	A	19-05-2010
			US 2011017086	A	27-01-2011



Rijksdienst voor Ondernemend
Nederland

SCHRIFTELIJKE OPINIE

Octrooiaanvraag 2010763

Indieningsdatum: 7 mei 2013	Vorrangsdatum: 12 november 2012
Classificatie van het onderwerp ¹ : F42B 4/02	Aanvrager: Liuyang Yihelong Mfg. co., Ltd.

Deze schriftelijke opinie bevat een toelichting op de volgende onderdelen:

- ☒ Onderdeel I Basis van de schriftelijke opinie
- ☒ Onderdeel II Voorrang
- ☐ Onderdeel III Vaststelling nieuwheid, inventiviteit en industriële toepasbaarheid niet mogelijk
- ☐ Onderdeel IV De aanvraag heeft betrekking op meer dan één uitvinding
- ☒ Onderdeel V Gemotiveerde verklaring ten aanzien van nieuwheid, inventiviteit en industriële toepasbaarheid
- ☐ Onderdeel VI Andere geciteerde documenten
- ☐ Onderdeel VII Overige gebreken
- ☐ Onderdeel VIII Overige opmerkingen

De bevoegde ambtenaar:
ir A.A.M. Bexkens
Octrooicentrum Nederland

¹ Gedefinieerd volgens International Patent Classification (IPC).

Onderdeel I Basis van de schriftelijke opinie

Deze schriftelijke opinie is opgesteld op basis van de meest recente conclusies ingediend voor aanvang van het onderzoek.

Onderdeel II Voorrang

Deze schriftelijke opinie is opgesteld onder de aanname dat eventueel ingeroepen voorrang geldig is, tenzij hieronder anders is aangegeven. Controleren van de voorrang maakt geen deel uit van het reguliere onderzoek naar de stand van de techniek.

Onderdeel V Gemotiveerde verklaring ten aanzien van nieuwheid, inventiviteit en industriële toepasbaarheid

1. Verklaring

Nieuwheid	Ja : Conclusie(s) 4 - 6, 9, 10 Nee : Conclusie(s) 1 - 3, 7, 8
Inventiviteit	Ja : Conclusie(s) 4, 6 Nee : Conclusie(s) 5, 9, 10
Industriële toepasbaarheid	Ja : Conclusie(s) 1 - 10 Nee : Conclusie(s)

2. Literatuur en toelichting

Van de literatuur, die in het rapport betreffende het onderzoek naar de stand van de techniek is vermeld, worden de volgende documenten besproken:

D1 = FR 2 715 998 A

D2 = EP 2 498 044 A

D3 = EP 2 278 256 A

Uit D1 is een persgevormd samengesteld vuurwerk bekend, omvattende een aantal evenwijdige buisvormige holtes (200) die uniform zijn aangebracht in een hoofdlichaam, waarbij de bovenste poorten van de buisvormige holtes open zijn en de onderste poorten van de buisvormige holtes afgedicht zijn; chemicaliën voor lanceren van vuurwerk en effectonderdelen zijn aangebracht in de buisvormige holtes; de afgedichte uiteinden van de buisvormige holtes voorzien zijn van ontstekingsgaten die de bodem van het hoofdlichaam doordringen, en de bodemopeningen van de ontstekingsgaten geplaatst zijn in een lontgroef (134), waarbij een afsnijdgroef (135) is voorzien tussen de bodemopeningen van de ontstekingsgaten in de lontgroef en de lontgroef is afgedicht door lijm.

De gehele hoofdconclusie leest op de uit D1 bekende uitvoeringsvorm volgens figuur 5 en is daarmee niet nieuw. Behalve de hoofdconclusie zijn de volgconclusies 2, 3, 7 en 8 eveneens bekend uit D1 en daarmee niet nieuw.

Uit D2 en D3 zijn de maatregelen van de volgconclusies 5, 9 en 10, frame, vorm lontgroef en twee ontstekingslonten op zichzelf bekend en het toepassen van deze bekende maatregelen bij het uit D1 bekende samengesteld vuurwerk is niet inventief.

De maatregelen van de volgconclusies 4 en 6 zijn niet gevonden in de octrooiliteratuur.