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(54) **LUMINESCENT BODY**

(57) A luminescent body (1) has a casing (1A) and a light source (6) housed in the casing; the casing (1A) comprises a front wall (2) at least partially permeable to light, a rear wall (3) and a peripheral wall (4) surrounding the front (2) and rear walls (3) and firmly connected to the front and rear walls; the peripheral wall (4) having an

inner reinforcement portion (10) and an outer coating portion (11) firmly connected to the reinforcement portion (10) and made of elastomeric foam material, preferably a closed-cell polymeric foam material and, conveniently, EPDM or EVAFOAM.

FIG. 2

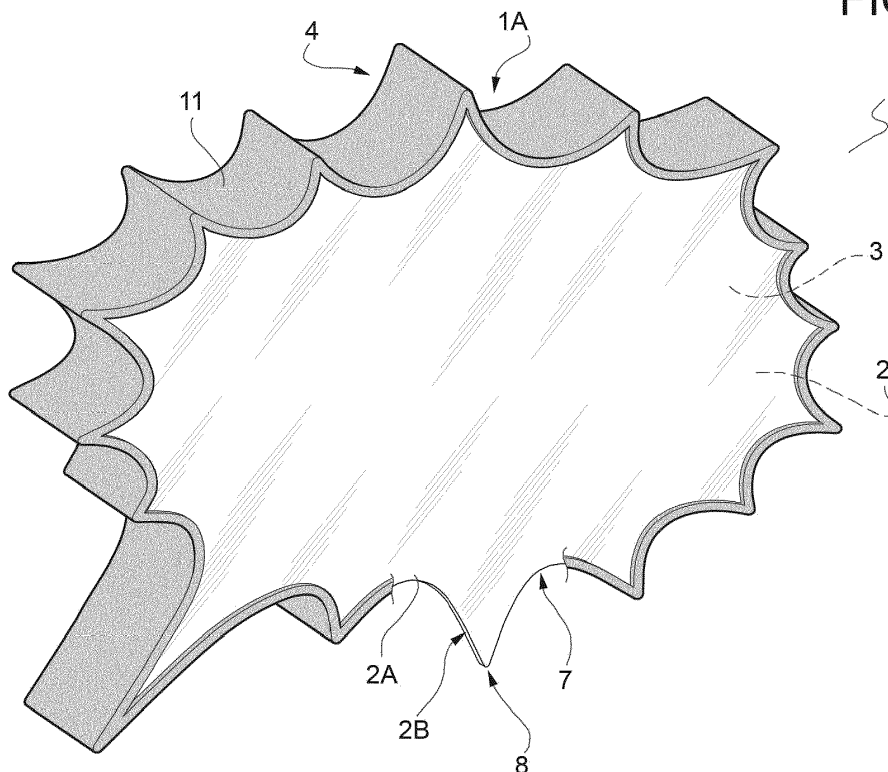
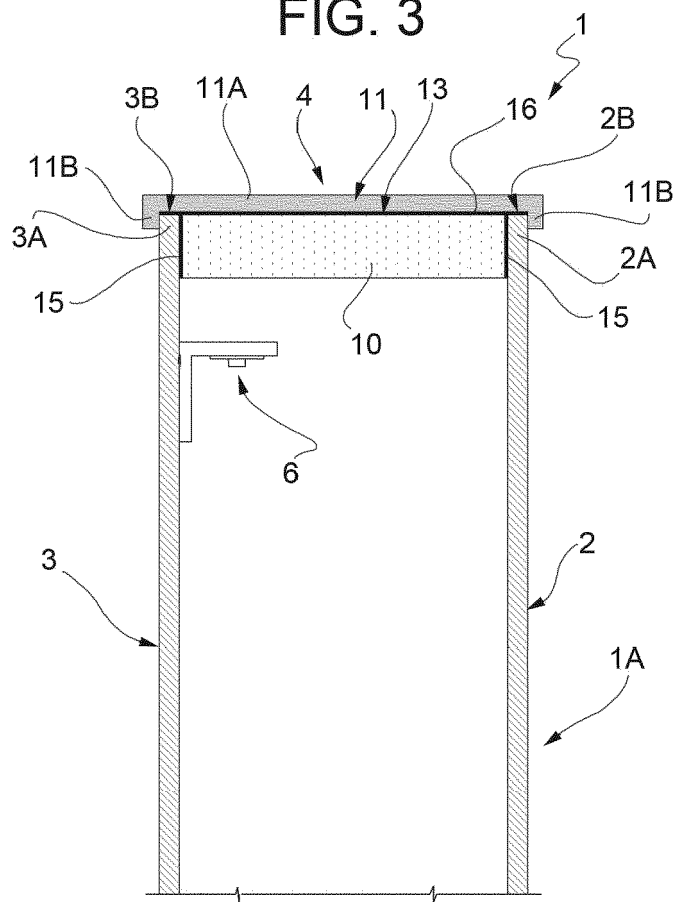


FIG. 3



Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority from Italian patent application no. 10202000027537 filed on November 17, 2020.

TECHNICAL FIELD

[0002] The present invention relates to a luminescent body.

[0003] In particular, the present invention relates to a luminescent body, for example, a sign, a lamp or an ornamental object, of the type comprising an outer casing at least partially permeable to light and a light source housed in the outer casing.

STATE OF THE PRIOR ART

[0004] Currently, various modes for manufacturing the outer casing are known. One of such modes provides for the use of two plates or sheets, of which at least one is permeable to light, and an outer peripheral frame that surrounds and joins the outer peripheral portions of the plates to each other.

[0005] Currently, there is an ever greater need to be able to customise and configure the luminescent bodies both in the commercial and illumination sectors, and for personal or decorative needs and thus purely aesthetic needs.

[0006] The abovementioned need, however, is hindered, on the one hand, by the traditional industrial production processes normally used, which tend to simplify the shapes in order to facilitate their manufacture and contain production costs.

[0007] Sporadic attempts to manufacture bodies with shapes different from the traditional ones have come up against high production costs, with the impossibility of ensuring large quantities of products in relatively short periods of time and, above all, with the impossibility of ensuring a high and unvarying aesthetic quality.

OBJECT OF THE INVENTION

[0008] The object of the present invention is to manufacture a luminescent body, which allows solving the problems set out above in a simple and cost-effective manner.

[0009] A particular aim of the present invention is to manufacture luminescent bodies with peripheral edges of any geometry or curvature and having a high and unvarying qualitative and aesthetic level and a reasonable price.

[0010] According to the present invention, a luminescent body is manufactured, which comprises a casing and a light source housed in said casing; the casing comprising a front wall, a rear wall, a peripheral wall surround-

ing the front and rear walls and firmly connected to the front and rear walls; at least one of said front and rear walls comprising at least one portion permeable to light, characterised in that said peripheral wall comprises an outer coating portion and in that it comprises fixing means for fixing said outer coating portion to said front and rear walls; said outer coating portion being made of elastomeric foam material.

[0011] Preferably, in the luminescent body defined above, the outer coating portion is made of closed-cell polymeric foam material.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The invention will now be described with reference to the accompanying figures, which illustrate a non-limiting example embodiment thereof, wherein:

Figure 1 is a front view of a preferred embodiment of a luminescent body manufactured according to the principles of the present invention;

Figure 2 is a perspective view, on an enlarged scale, of the luminescent body of Figure 1;

Figure 3 is a section, with parts removed for the sake of clarity, according to the line III-III of Figure 1;

Figure 4 is a figure analogous to Figure 3 and illustrates a variant of a detail of Figure 3;

Figure 5 is a perspective view, with parts removed for the sake of clarity, of a further preferred embodiment of a luminescent body according to the present invention;

Figure 6 is a section, on an enlarged scale and with parts removed for the sake of clarity, according to the line VI-VI of Figure 5; and

Figure 7 is a figure analogous to Figure 6 and illustrates a variant of a detail of Figure 5.

PREFERRED EMBODIMENT OF THE INVENTION

[0013] In Figures 1 and 2, reference numeral 1 indicates, as a whole, a luminescent body.

[0014] Here and in the following, the term "luminescent body" means a body having any shape, geometry and outer profile and intended to carry out any function such as, for example, a function of a sign, of an indication or displaying of information, of illumination, etc.

[0015] With reference to Figure 2 and, in particular, to Figure 3, the body 1 comprises a casing 1A, which in turn comprises a front or frontal wall 2, a rear or bottom wall 3 and a peripheral wall 4.

[0016] The peripheral wall 4 is a structural wall, which surrounds the walls 2 and 3 and is firmly connected to respective outer peripheral portions 2A and 3A of said walls 2 and 3.

[0017] The body 1 further comprises a light source 6, for example an LED, arranged inside the casing 1A. Preferably, the light source 6 is connected to or carried by the rear wall 3. Alternatively, the light source is carried

by the side wall 4. In the described example, the walls 2 and 3 both consist of flat sheets, whose outer peripheral portions 2A and 3A are delimited along their outer periphery by respective peripheral surfaces 2B and 3B.

[0018] In the described example, the front wall 2 is a wall completely permeable to light. According to a variant not illustrated, the wall 2 is only partially permeable to light so as to define, in use, a set of lights and shadows or shades of colours.

[0019] Conveniently, the front wall 2 is made of an opaline material.

[0020] Conveniently, moreover, both walls 2 and 3 are made of Plexiglass. Conveniently, moreover, the wall 3 is an opaque wall made, for example, of PVC foam or other materials permeable to light. According to a variant not illustrated, at least one of the walls comprises at least one concave or convex portion and/or bulges or recesses or supports an engraved or printed or silk-screen printed text and/or an image or a figure.

[0021] According to a preferred embodiment, one or both walls 2,3 support, laid or glued in a releasable or non-releasable manner, a relative foil displaying one or more images and/or texts and at least partially permeable to light.

[0022] According to a variant not illustrated, both walls 2 and 3 are at least partially permeable to light.

[0023] In the described example, the walls 2 and 3 are dimensionally and geometrically identical to each other, i.e. they are perfectly superimposable.

[0024] In the described example, moreover, both walls 2 and 3 are walls with a shaped outer profile and thus the peripheral surfaces 2B and 3B comprise a plurality of concave portions 7 joined to each other to form a plurality of cusps 8 (Figure 2).

[0025] According to a variant not illustrated, at least part of the concave portions 7 are replaced by convex portions and, in general, by portions with concavities different from those indicated by way of example and/or different from each other.

[0026] According to a further variant not illustrated, at least part of the concave portions 7 are replaced by flat portions.

[0027] Regardless of the shape of the peripheral surfaces 2B,3B, in the illustrated example, the side wall 4 straddles the walls 2 and 3 and comprises an inner annular reinforcement portion 10 and an outer annular coating and finishing portion 11.

[0028] The annular portion 10 extends between the portions 2A and 3A and is delimited outwards by a shaped surface 13 which forms the extension of the outer peripheral surfaces 2B and 3B, as shown in Figure 3.

[0029] Conveniently, the annular portion 10 is made of extruded EPS or of polystyrene foam cut by hot wire or by milling or by laser along the outer peripheral edges of the walls 2 and 3 or is made of other equivalent material designed to withstand the pressures that can be exerted on the wall 4 from the outside, for example, by the fingers of a person's hands during the handling of the body 1

and directed towards the inside of the casing 1A.

[0030] Preferably, the annular portion 10 is firmly connected to the walls 2 and 3 by gluing.

[0031] Conveniently, the walls 2 and 3 are connected to the portion 10 by the interposition of a double-sided adhesive tape 15 (Figure 3).

[0032] Still with reference to Figure 3, the coating portion 11 is C-shaped and comprises an intermediate portion 11A and two side portions 11B turned down over the peripheral portions 2A,3A.

[0033] According to a variant not illustrated, the coating portion 11 is devoid of the portions 11B and the portion 11 ends flush with the walls 2 and 3 or slightly protrudes cantilevered beyond the outer surfaces of said walls 2 and 3.

[0034] The coating portion 11 is firmly connected to the surfaces 2B, 3B and to the reinforcement portion 10 by gluing or, conveniently, by the interposition of a double-sided adhesive tape 16. The portions 11B, instead, are not glued to the walls 2 and 3 but simply arranged in abutment against the outer surfaces of said walls 2 and 3.

[0035] According to a variant, the surfaces 2B and 3B are not glued to the portion 11 either.

[0036] In the variant illustrated in Figure 4, the outer surface 13 of the reinforcement portion 10 is set back with respect to the surfaces 2B and 3B and the coating portion 11 is provided with circumferential grooves 18 engaged by the peripheral portions 2A and 3A. Also in such embodiment, the coating portion 11 is glued to the surfaces 2B,3B and to the reinforcement portion 10 by the interposition of double-sided adhesive tapes 16 or glue. According to a variant not illustrated, the reinforcement portion 10 may lack. In such case, the part of the coating portion 11 arranged between the portions 2A and 3A carries out the reinforcement function on its own.

[0037] According to a further variant, the coating portion 11 comprises a single groove 18, for example the one engaged by the portion 2A. In such case, the portion 3B is arranged in abutment against the portion 11, to which it is glued with glue or by double-sided adhesive tape. Still in such case, the portion 11B relative to the wall 3 may lack and the coating portion 11 ends flush with said wall 3 or slightly protrudes cantilevered beyond the outer surface of the wall 3.

[0038] In the variant illustrated in Figures 5 and 6, the reinforcement portion 10 is replaced by a corrugated portion 20, this too stabilising, connected to the coating portion 11 by gluing or double-sided adhesive tapes as indicated in the foregoing.

[0039] Preferably, the corrugated portion 20 is defined by a ribbed strip of paper-based material or other material that can be manually and plastically moulded, for example comprising aluminium or plastic materials and, in general, a material that allows faithfully following and maintaining the curvature of the outer peripheral edges of the plates 2 and 3 whatever the profile, even in the presence of cusps or significant variations in curvature. Whatever reinforcement material is used, it must be able to with-

stand the manual pushes directed towards the inside of the casing 1A so as to make peripheral walls having restrained and at most null deflections.

[0040] Still in the described example, the corrugated portion 20 has an ordered and periodic succession of rectilinear projections 21 protruding towards the inside of the casing 1A and delimiting between each other a plurality of rectilinear grooves 22 or cavities which extend orthogonally to the walls 2 and 3 and have a concavity facing towards the inside of the casing 1A (Figure 5). In this manner, the projections 21 are connected to each other by weakened portions which facilitate the rotation or the displacement of the projections 21 with respect to each other in the concave 7 or convex sections, if present, and at the cusps 8. The substantially plastic deformation of such weakened portions further allows counteracting any residual elastic tensions of the coating and finishing portion 11.

[0041] Conveniently, the projections 21 taper towards the inside of the casing 1A and the grooves 22 are flared still towards the inside of said casing 1A.

[0042] Regardless of how the corrugated portion 20 is manufactured, it is firmly connected to the coating portion 11 by gluing or other equivalent mode of firm connection. Preferably, the portions 11 and 20 are connected to each other by double-sided adhesive tapes 16.

[0043] In the variant illustrated in Figure 7, the coating portion 11 and the reinforcement portion 20, regardless of their shape or how they are manufactured, form part of a body 25 made in a single piece and with the same material with which the coating portion 11 is made. Preferably, also in this solution, the reinforcement portion has the projections 21 and the grooves 22.

[0044] Regardless of its geometry, the coating portion 11 is made of elastomeric foam material. Preferably, the portion 11 is made of closed-cell polymeric foam material.

[0045] Conveniently, the coating portion 11 is made with a material selected from the group consisting of ethylenevinyl acetate (EVA), Ethylene-Propylene Diene Monomer (EPDM), chloroprene, styrene butadiene rubber (SBR), natural rubber, nitrile-butadiene rubber (NBR), ethylene vinyl monomer (EVM) and mixtures thereof.

[0046] According to a preferred embodiment, the coating portion 11 is made of EPDM or of EVAFOAM.

[0047] Alternatively, the coating portion 11 is made of a material sold under the name SE32CE by the company SOGIMI.

[0048] The materials listed above are elastically deformable materials, they all have high conformability or malleability and high stability or shape memory. This allows manufacturing bodies having high aesthetic quality with continuous and homogeneous peripheral profiles, i. e. devoid of discontinuities, such as bulges or wrinkles even and especially in the presence of significant variations in curvature.

[0049] In other words, the aforementioned coating materials alone allow manufacturing peripheral walls and,

therefore, structured luminescent bodies of high shape stability and high aesthetic quality, whatever the outer peripheral profile of the plates 2 and 3 and regardless of the radii of curvature of the curved portions of said peripheral profiles.

[0050] The aesthetic quality is further enhanced by the particular C shape of the coating portion and in any case by the fact that the turned-down side portions 11B of said coating portion 11 are arranged in abutment against the outer surfaces of the peripheral portions 2A, 3A, as is clearly visible in Figures 3, 4, 6 and 7. Such turned-down portions define a finishing shutter, which, due to the chemical-physical characteristics of the material of the portion 11, is devoid of discontinuities and, when superimposed on the walls 2, 3, masks the joint between said side walls 2 and 3 and the peripheral wall 4.

[0051] Moreover, the turned-down side portions 11B, by effect of the elasticity of the material, exert, once assembly has been completed, a pressure over the entire periphery of the relative wall 2, 3. In the case where the aforementioned foils are placed on the side walls 2, 3, as indicated in the foregoing, such pressure is sufficient to maintain the foils in firm positions with respect to the walls 2, 3 and to hold their peripheral edges in adherence to said walls 2, 3, further improving the quality of the product and its aesthetic appearance.

[0052] In addition, the elasticity of the entire coating portion 11 makes the replacement of the foils even easier and faster should also the surfaces 2B and 3B not be glued to said portion 11. In any case, the elasticity of the coating portion 11 allows using foils of different thickness.

[0053] The shape stability of the peripheral wall 4 is further increased by the reinforcement portions 10 and 20 and, in particular, improved by the presence of the corrugated portion 20, which, in addition to stiffening the side wall 4 and counteracting the inevitable elastic returns of the coating portion 11, also carries out a function of guiding the strip during the winding around the walls 2 and 3. In particular, in the case of flat side walls 2 and 3, the corrugated portion allows making, in an extremely simple and efficient manner, bends that are always orthogonal to said side walls 2 and 3.

[0054] It is evident in light of the foregoing that the described manufacturing methods allow manufacturing luminescent bodies of any shape and/or geometry and thus able to satisfy any request, need or customisation, in an extremely simple manner, in particularly short periods of time and at a particularly reasonable price.

[0055] At the same time, the manufacturing method of the peripheral wall 4 and the materials envisaged for its manufacture allows making bodies with a high degree of finishing and an unquestionable aesthetic quality that remains unaltered during the use of the luminescent body.

[0056] Said used materials, whatever their initial colouring, can in any case be easily painted in a light colour, preferably white, so that the chamber that houses the light source 6 is delimited by a light-coloured surface which makes uniform and increases the light emission

of the body 1.

[0057] It is evident from the foregoing that modifications and variants can be made to the described luminescent body 1 without thereby departing from the scope of protection defined by the independent claim. In particular, the geometries or the dimensional ratios may be different, as well as the methods for connecting to each other the various parts that make up the luminescent body 1.

Claims

1. A luminescent body (1) comprising a casing (1A) and a light source (6) housed in said casing; the casing (1A) comprising a front wall (2), a rear wall (3), a peripheral wall (4) surrounding the front (2) and rear (3) walls and firmly connected to the front and rear walls; at least one (2) of said front and rear walls comprising at least one portion permeable to light, **characterised in that** said peripheral wall (4) comprises an outer coating portion (11) and **in that** it comprises fixing means (15,16) for fixing said outer coating portion (11) to said front (2) and rear (3) walls; said outer coating portion (11) being made of elastomeric foam material.
2. The body according to claim 1, **characterised in that** said outer coating portion (11) is made of closed-cell polymeric foam material.
3. The body according to claim 1 or 2, **characterised in that** said outer coating portion is made with a material that is selected from the group consisting of ethylenevinyl acetate (EVA), Ethylene-Propylene Diene Monomer (EPDM), chloroprene, styrene butadiene rubber (SBR), natural rubber, nitrile-butadiene rubber (NBR), ethylene vinyl monomer (EVM) and mixtures thereof.
4. The body according to claim 3, **characterised in that** said outer coating portion (11) is made of EPDM, or EVA foam or EVAFOAM.
5. The body according to any one of the preceding claims, **characterised in that** said connection means comprise glues or adhesive materials (15)(16).
6. The body according to any one of the preceding claims, **characterised in that** said peripheral wall (4) comprises a reinforcement portion (10); (20) of said outer coating portion (11); said reinforcement portion extending between said front and rear walls and being firmly connected to said front and rear walls and to said outer coating portion (11).
7. The body according to claim 6, **characterised in**

that said front (2) and rear (3) walls are delimited by respective outer peripheral surfaces (2B)(3B) and **in that** said reinforcement portion is delimited by a further outer peripheral surface (13) that forms an extension of said peripheral surfaces (2B) (3B) or is moved backwards towards the inside of the casing (1A) with respect to the same peripheral surfaces; said outer coating portion being rested on said further surface and firmly connected to the same further outer peripheral surface (13).

8. The body according to claim 6, **characterised in that** said reinforcement portion (20) is a corrugated portion having ridges (21) extending transversely to said front (2) and rear (3) walls and delimiting between one another a plurality of grooves (22) having concavities facing towards the inside of the casing (1A).
9. The body according to claim 8, **characterised in that** said outer coating portion (11) and said reinforcement portion form part of a body made in a single piece and with the same material with which said coating portion (11) is made.
10. The body according to claim 8 or 9, **characterised in that** said outer coating portion (11) comprises, for at least one of the said front (2) and rear (3) walls, a relative circumferential groove (18), and **in that** at least one of said front and rear walls has a relative outer peripheral portion (3A)(3B) engaging said circumferential groove (18).
11. The body according to any one of the preceding claims, **characterised in that** said outer coating portion (11) comprises a central portion (11A) and two side portions (11B) turned over on the outer surfaces of the front and rear side walls; said side portions (11B) being elastically forced against said outer surfaces.

FIG. 1

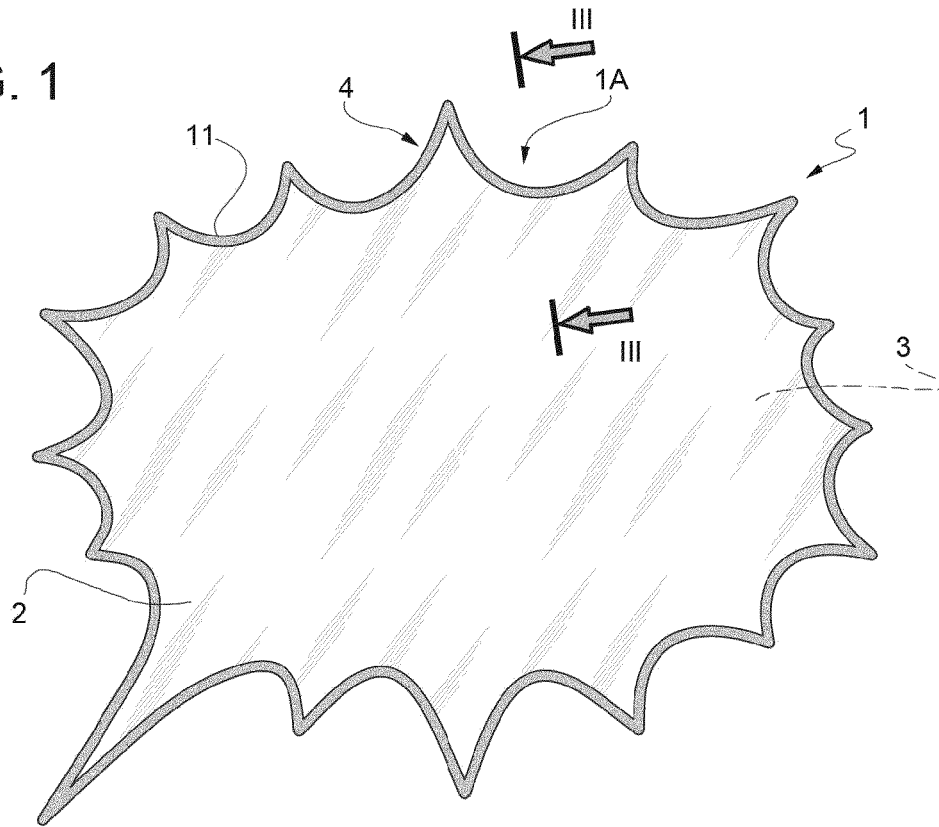


FIG. 2

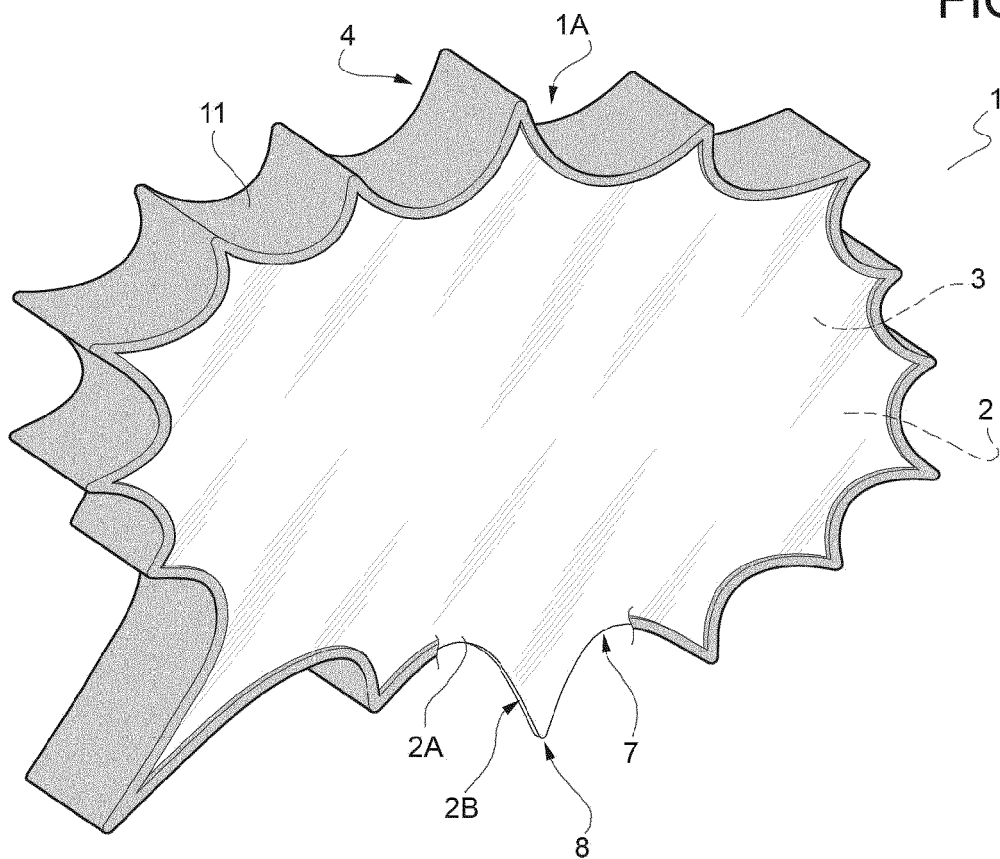


FIG. 4

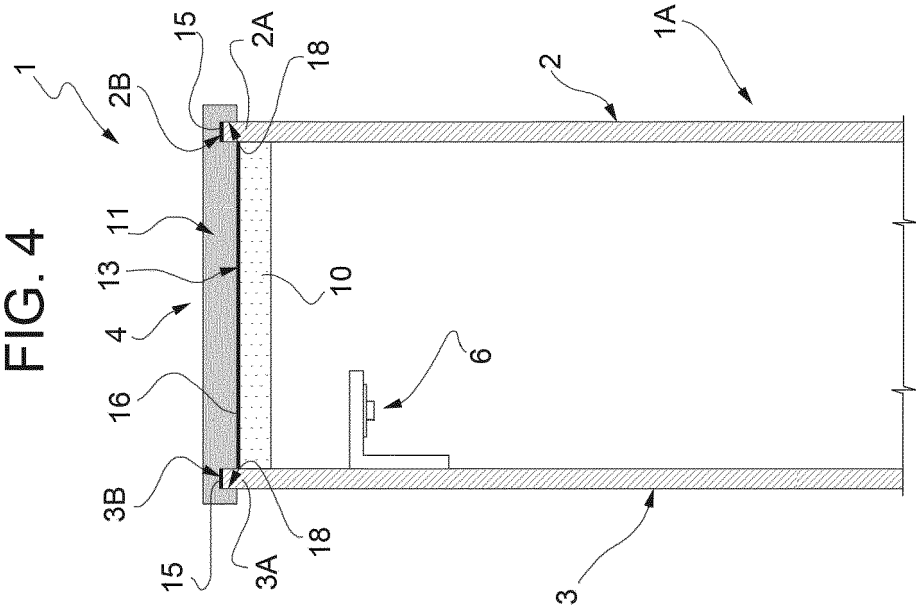
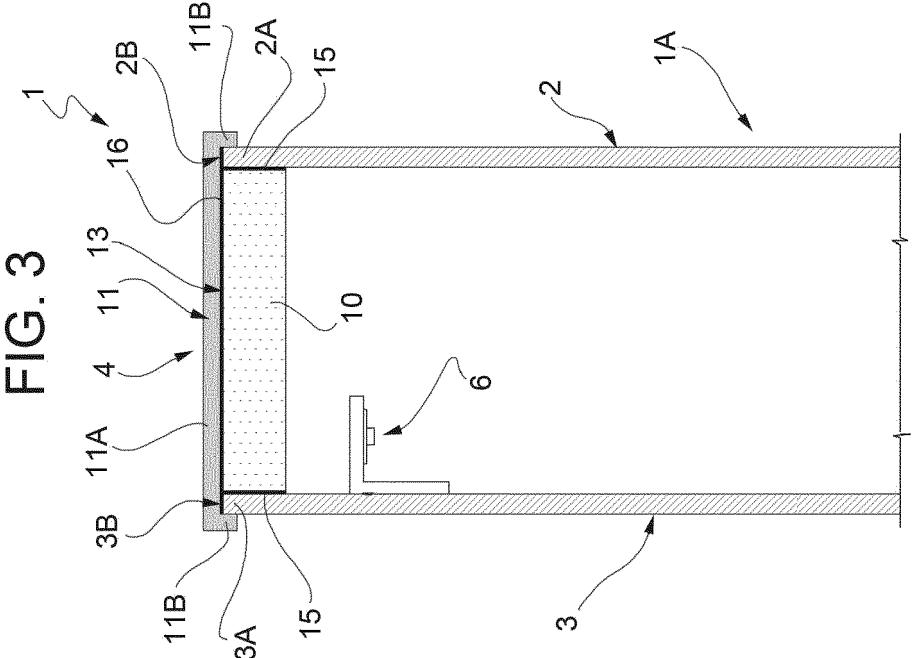


FIG. 3



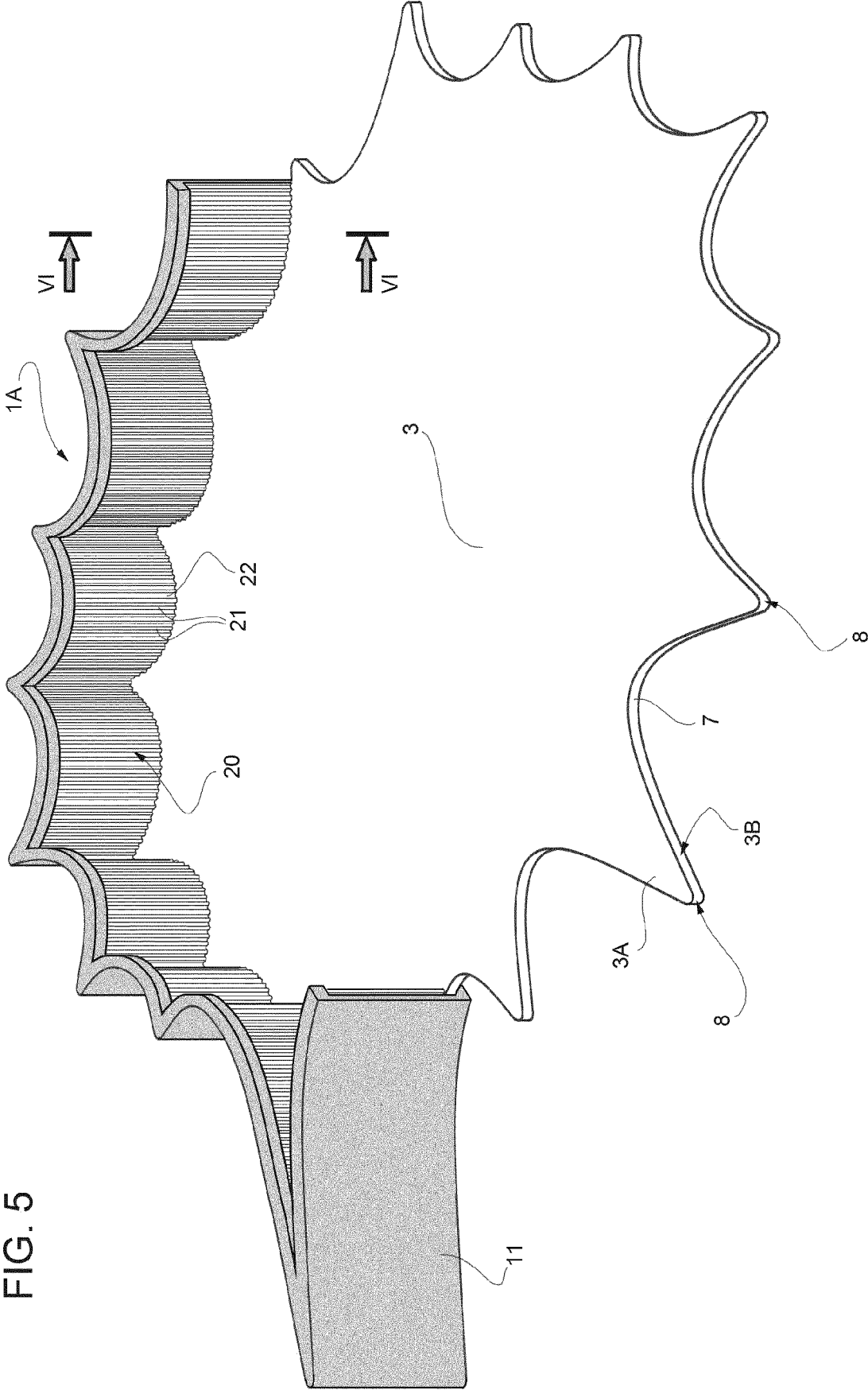


FIG. 7

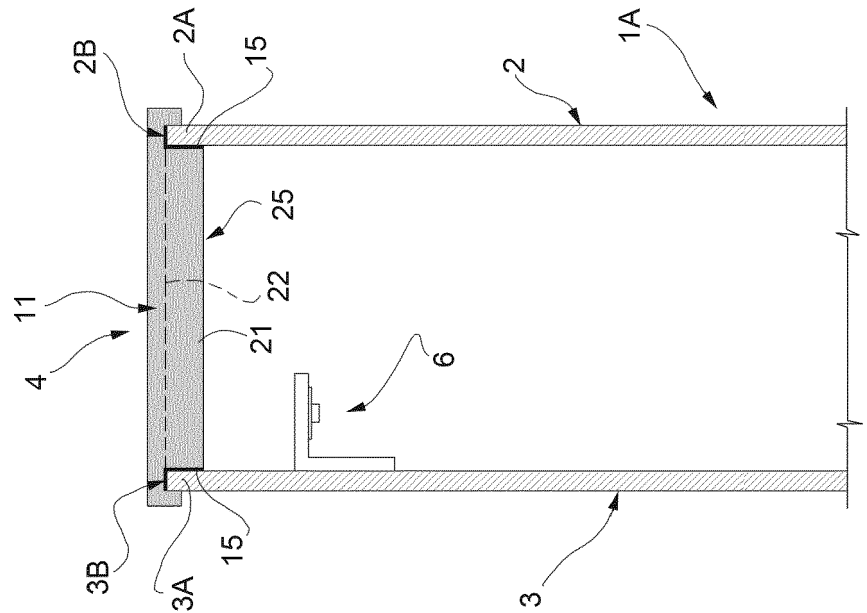
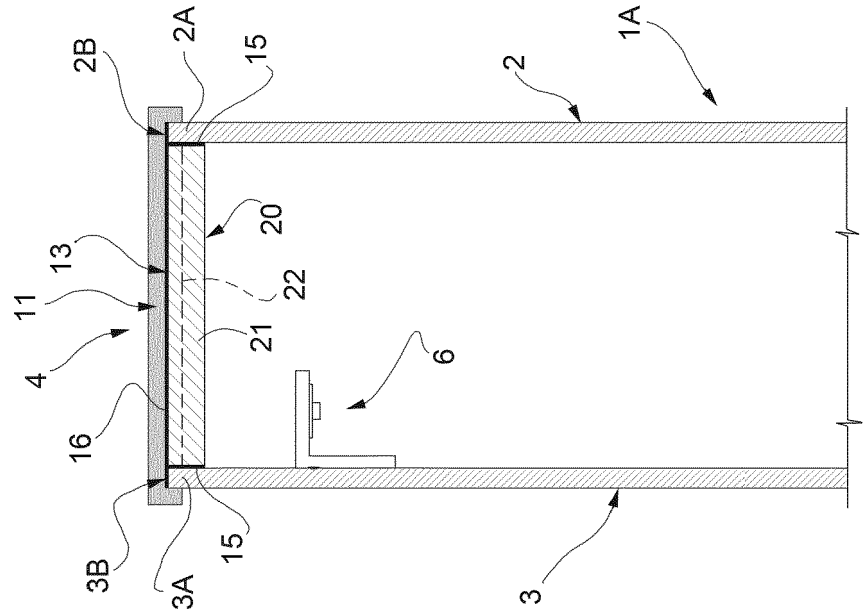


FIG. 6





EUROPEAN SEARCH REPORT

Application Number

EP 21 20 8857

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 20 2006 005991 U1 (ZUMTOBEL LIGHTING GMBH [AT]) 12 October 2006 (2006-10-12)	1	INV.
Y	* figures 1-8 *	2-6, 8	F21V3/04
A		7, 9-11	F21V3/10

X	WO 2014/170075 A1 (OSRAM GMBH [DE]) 23 October 2014 (2014-10-23)	1	
Y	* figure 1 *	2-6, 8	
A		7, 9-11	

Y	EP 2 347 773 A1 (PROCTER & GAMBLE [US]) 27 July 2011 (2011-07-27)	2-6, 8	
A	* paragraphs [0038] - [0040], [0065] *	1, 7, 9-11	

X	KR 101 721 027 B1 (SFEELKOREA [KR]) 18 April 2017 (2017-04-18)	1	
	* paragraph [0083]; figure 3 *		

X	US 2018/245754 A1 (GENSLER STEVEN W [US] ET AL) 30 August 2018 (2018-08-30)	1	
	* figures 1-10 *		

X	KR 101 971 706 B1 (SSC LIGHTING [KR]) 24 April 2019 (2019-04-24)	1	
	* paragraph [0034]; figures 1-4 *		

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			F21V F21W F21Y F21S G09F
Place of search		Date of completion of the search	Examiner
The Hague		6 April 2022	Kebemou, Augustin
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone		T : theory or principle underlying the invention	
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P : intermediate document		& : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 21 20 8857

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 202006005991 U1	12-10-2006	DE 202006005991 U1	12-10-2006
		EP 1845305 A1	17-10-2007

WO 2014170075 A1	23-10-2014	CN 104110652 A	22-10-2014
		EP 2986898 A1	24-02-2016
		US 2016076728 A1	17-03-2016
		WO 2014170075 A1	23-10-2014

EP 2347773 A1	27-07-2011	CA 2646355 A1	20-09-2007
		EP 1998820 A2	10-12-2008
		EP 2347773 A1	27-07-2011
		JP 5175263 B2	03-04-2013
		JP 2009530774 A	27-08-2009
		KR 20080109832 A	17-12-2008
		US 2007230189 A1	04-10-2007
		US 2010220464 A1	02-09-2010
		WO 2007106547 A2	20-09-2007

KR 101721027 B1	18-04-2017	NONE	

US 2018245754 A1	30-08-2018	US 2018245754 A1	30-08-2018
		US 2019368683 A1	05-12-2019

KR 101971706 B1	24-04-2019	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT 102020000027537 [0001]