

(19)



(11)

EP 4 286 742 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:

14.05.2025 Bulletin 2025/20

(21) Application number: **22176412.9**

(22) Date of filing: **31.05.2022**

(51) International Patent Classification (IPC):

F21S 43/14 ^(2018.01) **F21S 43/15** ^(2018.01)
F21S 43/239 ^(2018.01) **F21S 43/241** ^(2018.01)
F21S 43/245 ^(2018.01) **F21S 43/249** ^(2018.01)
F21V 8/00 ^(2006.01)

(52) Cooperative Patent Classification (CPC):

F21S 43/14; F21S 43/15; F21S 43/239;
F21S 43/245; F21S 43/249

(54) **AUTOMOTIVE LIGHTING AND/OR SIGNALING DEVICE WITH A LIGHT GUIDE**

BELEUCHTUNGS- UND/ODER SIGNALISIERUNGSVORRICHTUNG FÜR KRAFTFAHRZEUGE MIT EINEM LICHTLEITER

DISPOSITIF D'ÉCLAIRAGE ET/OU DE SIGNALISATION AUTOMOBILE AVEC UN GUIDE DE LUMIERE

(84) Designated Contracting States:

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR

(43) Date of publication of application:

06.12.2023 Bulletin 2023/49

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Description

FIELD OF APPLICATION

[0001] The present invention relates to an automotive lighting and/or signaling device.

BACKGROUND ART

[0002] The term automotive lighting and/or signaling device is used here in a very broad sense to comprise an automotive light, either rear or front, the latter also named a headlight or headlamp.

[0003] As is known, an automotive light serves to provide a signal or make the roadbed visible to the driver. In other words, the automotive light is a device intended to provide at least one lighting and/or signaling function of the vehicle. Lighting and/or signaling functions of the vehicle, for example include the position light, the turn signal, the brake light, the rear fog lamp, the reversing light, the dipped beam light, the high beam light, the daytime running light, and further similar lights typical of automotive lights. The device may also perform a merely aesthetical function, such as lighting devices that show logos and the like, which may be located both outside and inside the vehicle.

[0004] The present invention is particularly applied to lighting and/or signaling devices that use at least one LED light source that emits a light beam which is channeled in a light guide, through an inlet wall, called "incoupling", of said light guide. Subsequently, the light beam is reflected into the light guide and extracted through a front wall by means of specific extractors arranged along a rear wall called "outcoupling", opposite to said front wall.

[0005] It is fundamental there be no uneven concentrations and/or overlapping of light rays (i.e., spots) on the rear wall because in this case, said spots would also be repeated on the front wall, therefore being visible from the outside.

[0006] Indeed, the end user requires a uniform and homogenous distribution of the light beams, brightness being equal, possibly devoid of any spots.

[0007] Spots substantially are created from the overlapping and/or concentration of several light rays reflected into the light guide which tend to concentrate in certain areas of the outcoupling. The overlapping is due to that fact that separate light rays tend to overlap and/or concentrate in inhomogeneous manner in certain areas of the outcoupling due to the successive reflections inside the light guide.

[0008] The phenomenon is felt even more when the light guide has an overall reduced thickness and a particularly extensive rear wall, i.e., an outcoupling, such as, for example what occurs in the case of long and thin light guide plates or bars. Devices with such light guides are known from DE 19908961 A1 and DE 4129094 A1.

PRESENTATION OF THE INVENTION

[0009] It is the object of the present invention to provide a lighting and/or signaling device obtained with a rigid union technique of the internal components inside the container body, which overcomes the limitations of the techniques described in relation to an assembly of conventional type.

[0010] Such a need is met by an automotive lighting and/or signaling device according to claim 1.

[0011] Other embodiments of the present invention are described in the dependent claims.

DESCRIPTION OF THE DRAWINGS

[0012] Further features and advantages of the present invention will be more comprehensible from the following description of preferred and non-limiting embodiments thereof, in which:

Figure 1 shows a perspective view, with separated parts, of a lighting and/or signaling device according to a possible embodiment of the present invention; Figure 2 shows a perspective view, in an assembled configuration, of the lighting and/or signaling device in Figure 1;

Figure 3a shows a sectional view of the lighting and/or signaling device in Figure 2, along the section plane III-III, according to a solution of the known art; Figure 3b shows a sectional view of the lighting and/or signaling device in Figure 2, along the section plane III-III, according to an embodiment of the present invention;

Figure 4 shows a perspective view of component IV shown in Figure 1;

Figure 5 shows a top plan view of the component in Figure 4;

Figure 6 shows a perspective view of an enlarged detail of the component in Figure 4;

Figure 7 shows the enlarged detail VII indicated in Figure 4;

Figure 8 shows the enlarged detail VIII indicated in Figure 5.

[0013] The elements or parts of elements common to the embodiments described below will be indicated using the same numerals.

DETAILED DESCRIPTION

[0014] With reference to the aforesaid drawings, a lighting and/or signaling device, such as an automotive light, to which the following disclosure refers without however losing in generality, is indicated as a whole by 4.

[0015] As mentioned above, the expression "lighting and/or signaling device" may indifferently mean either an automotive rear light or an automotive front light, the latter also known as headlight or headlamp, comprising a light

external to the vehicle having a lighting and/or signaling function, such as, for example, a position light, which may be a front position light, a taillight, a side marker, a turn signal, a brake light, a rear fog lamp, a high beam light, a dipped beam light, and the like.

[0016] Thus, as better described below, the device in its signaling function may comprise the possibility of sending light signals, logos, but also words and lit messages of any kind. Thus, the device may perform a merely aesthetical function, such as lighting devices that show logos and the like, which may be arranged both outside and inside the vehicle.

[0017] The lighting and/or signaling device 4 comprises a container body or hollow housing 8, usually made of polymeric material, such as, for example acrylonitrile butadiene styrene, or ABS, which conventionally allows fixing the lighting and/or signaling device 4 to the related vehicle or to any type of support.

[0018] For the purposes of the present invention, the container body or housing 8 may have any shape, size or position: for example, the container body 8 may also not be directly connected to the bodywork or other external fixings of the associable vehicle.

[0019] The container body 8 delimits a containment seat 12 which accommodates a plurality of components of said lighting and/or signaling device.

[0020] The containment seat 12 in particular accommodates at least one light source 16 arranged and supported inside said containment seat 12. The at least one light source 16 preferably comprises LED or mini LED light sources adapted to emit a light beam comprising a plurality of light rays 18 which extend along a main optical propagation axis X-X.

[0021] For example, a lenticular body 20 may be placed at least partially to close the container body 8 so as to close said containment seat 12 which accommodates the light source 16.

[0022] For the purposes of the present invention, the lenticular body 20 is external to the lighting and/or signaling device 4 so as to define at least one outer wall of the lighting and/or signaling device directly subject to the atmosphere, thus integrating with the line of the car, when the container body 8 is firmly recessed in the enclosure of the vehicle.

[0023] According to possible embodiments, the material of the lenticular body 20 is of polymeric type, that is a resin such as PMMA (poly methyl methacrylate), PC (polycarbonate) and the like. Said material of the lenticular body 20 is therefore at least partially transparent or semitransparent or translucent, one or more opaque portions being able to be included.

[0024] As shown, the containment seat 12 that extends along a first perimeter edge 28 is closed by the lenticular body 20 which extends along a second perimeter edge 32 at least partially counter-shaped to and overlapping said first perimeter edge 28.

[0025] The lighting and/or signaling device 4 further comprises at least one light guide 24 formed with a

transparent polymeric material, such as PC, PMMA or the like, configured to at least partially receive the incoming light beam generated by said light source 16, transmit it by means of total internal reflection along a prevailing propagation direction and output it from the lenticular body 20, as better described below.

[0026] Said at least one light guide 24 is configured to at least partially receive said light rays 18 at an inlet wall 36 thereof (called incoupling), convey the light rays 18 and extract said light rays 18 by means of a rear wall 40 thereof (called outcoupling).

[0027] In particular, said rear wall 40 is provided with a plurality of optical extractor elements 44 that extract the light rays 18 and transmit them externally to the light guide 24 through a front wall 48 of the light guide 24, opposite to said rear wall 40, along a transverse direction T-T, perpendicular to the main optical propagation axis X-X.

[0028] In particular, said optical extractor elements 44 of the rear wall 40 comprise local discontinuities or surface alterations or prisms or the like, capable of reflecting the light in specular or scattered manner; moreover, the rear wall 40 may be embossed or etched, comprising projected incisions capable of scattering light.

[0029] Said front wall 48 of the light guide 24 in turn may comprise optical elements, such as cylindrical optics or pillow optics or the like, and/or scattering elements, such as an embossing portion and/or an etched portion.

[0030] According to the invention, with respect to a cross-section plane passing through said main optical propagation axis X-X and said transverse direction T-T, the inlet wall 36 of the light guide 24 has a middle section 52 with polyline geometry comprising a plurality of rectilinear sections and/or curvilinear sections 56 so as to overall be convex on the side of the at least one light source 16. The concept of polyline is to be understood in the broad sense: in other words, as better described below, the polyline is a set of rectilinear sections and/or curvilinear sections 56 that overall define a straight or (completely or partially) curved line that has a convexity on the side of the light source 16.

[0031] Preferably, especially in the case of light guides having a length which is less than 50 mm, said polyline is configured so that the light rays 18, introduced through the inlet wall 36 of the light guide 24, hit the rear wall 40 directly or following a single reflection on the front wall 48. Thereby, the scattering of the light rays on the rear wall 40 may be controlled so that it is uniform and homogeneous and does not have any light spots. For example, the comparison between Figures 3a and 3b shows how an inlet wall 36 (Figure 3a) does not allow sufficiently spacing apart two contiguous light rays 18', 18'' from each other, while an inlet wall 36 overall having convex polyline allows increased spacing of said contiguous light rays 18', 18''.

[0032] According to a possible embodiment of the present invention, said polyline comprises two mutually angled consecutive rectilinear sections 56 which form an

angle at the vertex which is greater than 180 degrees, on the side of the LED light source 16.

[0033] According to a possible embodiment of the present invention, said polyline comprises at least one rectilinear section and one curvilinear section 56 that are consecutive to each other so as to obtain an overall convex polyline on the side of the at least one light source 16.

[0034] According to a possible embodiment of the present invention, said polyline comprises two curvilinear sections 56 that are consecutive to each other so as to obtain an overall convex polyline on the side of the at least one light source 16.

[0035] In general, the curvilinear sections 56 may be arcs of circle, ellipse, parabola, hyperbole and the like.

[0036] According to the invention, the section plane passing through the main optical propagation axis X-X and the transverse direction T-T, the rectilinear and/or curvilinear sections 56 forming the polyline related to the cross section of the inlet wall 36 of the light guide 24 identify each one a skirt of the inlet wall 36.

[0037] According to the invention, the skirts of the adjacent inlet wall 36 are inclined and joined to one another at a vertex line.

[0038] Preferably, each skirt of the inlet wall 36 extends in a wavy manner along the longitudinal direction L-L.

[0039] In greater detail, and according to a possible embodiment of the present invention, each skirt of the inlet wall 36 of the light guide 24 comprises a plurality of adjacent optics 84 along a longitudinal direction L-L, perpendicular to the transverse direction T-T and the main optical propagation direction X-X. Preferably, said optics 84 have a "V" or "U" profile with the vertex facing the light source 16.

[0040] Therefore, such optics 84 follow one another so as to give the skirt of the inlet wall 36 a wavy structure having a related phase, amplitude and frequency.

[0041] Preferably, skirts of the inlet wall 36 have respective wavy structures having equal phase and/or amplitude and/or frequency. Obviously, at least one among such phase and/or amplitude and/or frequency of a skirt may be different from the others.

[0042] According to a possible embodiment of the present invention, said optics 84 are arranged along the longitudinal direction L-L according to a continuous sinusoidal pattern comprising alternating ridges 88 and depressions 92, at a constant pitch 96. Pitch 96 is the distance between two consecutive ridges 88 or depressions 92 along said longitudinal direction L-L.

[0043] According to a possible embodiment of the present invention, pitch 96 and the geometry of the optics 84 are configured so that the light beam emitted by each light source 16 hits two or more consecutive ridges 88 or depressions 92 of optics 84.

[0044] Preferably, said optics 84 have a height, i.e., a distance between the ridges 88 and the depressions 92, that is the height of the sinusoid, which is less than 1 mm.

[0045] Again, with reference to Figure 3b, a first skirt

56' of the inlet wall 36 is structured to refract and direct the light beam in a first proximal zone 100 of the rear wall 40, while a second skirt 56'' of the inlet wall 36 is structured to refract and direct the light beam in a second distal zone 102 of the rear wall 40, so as to involve the whole rear wall 40, said first proximal zone 100 and second distal zone 102 being contiguous to each other. In other words, since the first skirt 56' and the second skirt 56'' of the inlet wall 36 lie on respective mutually inclined lying planes, the light may be refracted with a much broader light distribution and thus involving the whole rear wall 40 - both the first proximal zone 100 and the second distal zone 102 - without light concentrations in the first proximal zone 100 of the rear wall 40.

[0046] According to a possible embodiment of the present invention, a transverse thickness 60 of the light guide 24 is equal to a subtended cord 64 at transverse ends 66, 68 of said polyline.

[0047] Preferably, in order to optimize the optical efficiency of the system, a light emission distribution 72 of said light sources 16 has transverse amplitude 76 which is comparable, for example equal, to said transverse thickness 60 of the light guide 24 so as to involve all the skirts.

[0048] According to a possible embodiment of the present invention, the light guide 24, at the inlet wall 36, has a pair of transverse appendices 80, on opposite sides with respect to said middle section 52 with polyline geometry, so as to facilitate the position of the light guide 24 in the container body 8.

[0049] As can be appreciated from the above description, the present invention allows overcoming the drawbacks introduced in the known art.

[0050] In particular, by virtue of the present invention, the outcoupling surface, or rear wall, of the light guide may be homogeneously lit by means of light rays emitted by the LED.

[0051] After being refracted into the inlet wall, or in-coupling, said light rays hit the rear wall directly or following a single rebound in the light guide: thereby, the mentioned homogeneity and the absence of undesired light spots may be obtained.

[0052] It is therefore possible to provide long and thin light guides and/or light guide plates without the risk of having light spots on the outlet wall, thus creating homogeneous and uniform lighting.

[0053] Those skilled in the art, with the object of meeting contingent and specific needs, can make several changes and variants to the lighting and/or signaling devices described without departing from the scope of protection of the present invention, the scope of protection being defined by the following claims.

55 Claims

1. A lighting and/or signaling device (4) for vehicles, comprising:

- a container body (8) that delimits a containment seat (12) which extends along a first perimeter edge (28), closed by a lenticular body (20) which extends along a second perimeter edge (32) at least partially counter-shaped to and overlapping said first perimeter edge (28),

- said containment seat (12) housing at least one LED or mini LED light source (16) adapted to emit a light beam comprising a plurality of light rays (18) which extend along a main optical propagation axis (X-X), and at least one light guide (24) configured to at least partially receive said light rays (18) at an inlet wall (36) thereof and to transmit and/or reflect said light rays (18) onto a rear wall (40) thereof,

- said rear wall (40) being provided with a plurality of optical extractor elements (44) which extract the light rays (18) and transmit them externally to the light guide (24) through a front wall (48) of the light guide (24), opposite to said rear wall (40), along a transverse direction (T-T), perpendicular to the main optical propagation axis (X-X),

- **characterized in that** with respect to a cross-section plane passing through said main optical propagation axis (X-X) and said transverse direction (T-T), said inlet wall (36) has a middle section (52) with polyline geometry comprising a plurality of rectilinear sections and/or curvilinear sections (56) so as to be overall convex on the side of the at least one light source (16),

wherein the rectilinear and/or curvilinear sections (56) each identify a skirt of the inlet wall (36), wherein adjacent skirts of the inlet wall (36) are inclined and joined to one another at a vertex line.

2. A lighting and/or signaling device (4) according to claim 1, wherein said polyline is configured so that the light rays (18), introduced through the inlet wall (36) of the light guide (24), hit the rear wall (40) directly or follow a single reflection on the front wall (48).
3. A lighting and/or signaling device (4) according to claim 2, wherein the light guide (24) has a length which is shorter than 50 mm.
4. A lighting and/or signaling device (4) according to claim 1, 2 or 3, wherein said polyline comprises two mutually angled consecutive rectilinear sections (56) which form an angle at the vertex that is greater than 180 degrees, on the side of the LED light source (16).
5. A lighting and/or signaling device (4) according to claim 1, 2, 3 or 4, wherein said polyline comprises at least one rectilinear section (56) and one curvilinear section (56) which are consecutive to each other so

as to obtain an overall convex polyline on the side of the at least one light source (16).

6. A lighting and/or signaling device (4) according to any one of claims 1 to 5, wherein said polyline comprises at least two consecutive curvilinear sections (56) so as to obtain an overall convex polyline on the side of the at least one light source (16).
7. A lighting and/or signaling device (4) according to any one of claims 1 to 6, wherein a transverse thickness (60) of the light guide (24) is equal to a subtended cord (64) at transverse ends (66, 68) of said polyline.
8. A lighting and/or signaling device (4) according to claim 7, wherein a light emission portion (72) of said light sources (16) has a transverse amplitude (76) equal to said transverse thickness (60) of the light guide (24).
9. A lighting and/or signaling device (4) according to any one of claims 1 to 8, wherein the light guide (24) has, at the inlet wall (36), a pair of transverse appendices (80), on opposite sides of said middle section (52) with polyline geometry.
10. A lighting and/or signaling device (4) according to any one of claims 1 to 9, wherein each skirt of the inlet wall (36) comprises a plurality of adjacent optics (84) along a longitudinal direction (L-L), perpendicular to the transverse direction (T-T) and to the main optical propagation direction (X-X), said optics (84) having a "V" or "U" profile with the vertex facing the light source (16).
11. A lighting and/or signaling device (4) according to claim 10, wherein each skirt of the inlet wall (36) extends in a wavy manner along the longitudinal direction (L-L).
12. A lighting and/or signaling device (4) according to either of claims 10 or 11, wherein said optics (84) are arranged along the longitudinal direction (L-L) according to a continuous sinusoidal pattern comprising alternating ridges (88) and depressions (92), at a constant pitch (96).
13. A lighting and/or signaling device (4) according to claim 12, wherein the pitch (96) and the geometry of the optics (84) are configured so that the light beam emitted by each light source hits two or more consecutive ridges (88) or depressions (92) of optics (84).
14. A lighting and/or signaling device (4) according to claim 10, 11, 12 or 13, wherein said optics (84) have a height, i.e., a distance between the ridges (88) and

the depressions (92), which is less than 1 mm.

15. A lighting and/or signaling device (4) according to any one of claims 1 to 14, wherein a first skirt (56') of the inlet wall (36) is structured to refract and direct the light beam in a first proximal zone (100) of the rear wall (40), while a second skirt (56'') of the inlet wall (36) is structured to refract and direct the light beam in a second distal zone (102) of the rear wall (40), so as to involve the whole rear wall (40), said first proximal zone (100) and second distal zone (102) being contiguous to each other.
16. A lighting and/or signaling device (4) according to any one of claims 1 to 15, wherein said optical extractor elements (44) of the rear wall (40) comprise optical elements, such as cylindrical optics or pillow optics or the like, and/or scattering elements, such as an embossing portion and/or an etched portion.
17. A lighting and/or signaling device (4) according to any one of claims 1 to 16, wherein said front wall (48) of the light guide (24) comprises scattering elements and/or an embossed portion and/or an etched portion.

Patentansprüche

1. Beleuchtungs- und/oder Signalisierungs Vorrichtung (4) für Fahrzeuge, umfassend:
 - einen Behälterkörper (8), der eine Eingrenzungsaufnahme (12) begrenzt, die sich entlang einer ersten Umfangskante (28) erstreckt und durch einen linsenförmigen Körper (20) verschlossen ist, der sich entlang einer zweiten Umfangskante (32) erstreckt, die zumindest teilweise gegengeformt ist und die erste Umfangskante (28) überlappt,
 - wobei die Eingrenzungsaufnahme (12) mindestens eine LED- oder Mini-LED-Lichtquelle (16) beherbergt, die zur Abgabe eines Lichtstrahls geeignet ist, der aus einer Vielzahl von Lichtstrahlen (18) besteht, die sich entlang einer optischen Hauptausbreitungsachse (X-X) erstrecken, und mindestens einen Lichtleiter (24), der konfiguriert ist, um die Lichtstrahlen (18) an einer Einlasswand (36) mindestens teilweise zu empfangen und die Lichtstrahlen (18) an eine Rückwand (40) weiterzuleiten und/oder zu reflektieren,
 - wobei die Rückwand (40) mit einer Vielzahl optischer Extraktionselemente (44) versehen ist, die die Lichtstrahlen (18) extrahieren und sie durch eine Vorderwand (48) des Lichtleiters (24) gegenüber der Rückwand (40) entlang einer Querrichtung (T - T) senkrecht zur optischen

Hauptausbreitungsachse (X-X) nach außen zum Lichtleiter (24) übertragen,

- **dadurch gekennzeichnet, dass** die Einlasswand (36) in Bezug auf eine Querschnittsebene, die durch die optische Hauptausbreitungsachse (X-X) und die Querrichtung (T - T) verläuft, einen Mittelabschnitt (52) mit Polyliniengeometrie aufweist, der eine Vielzahl geradliniger Abschnitte und/oder krummliniger Abschnitte (56) umfasst, so dass sie auf der Seite der mindestens einen Lichtquelle (16) insgesamt konvex ist,

wobei die geradlinigen und/oder krummlinigen Abschnitte (56) jeweils eine Schürze der Einlasswand (36) kennzeichnen, wobei benachbarte Schürzen der Einlasswand (36) geneigt sind und an einer Scheitellinie miteinander verbunden sind.

2. Beleuchtungs- und/oder Signalisierungs Vorrichtung (4) nach Anspruch 1, wobei die Polylinie so konfiguriert ist, dass die durch die Einlasswand (36) des Lichtleiters (24) eingeführten Lichtstrahlen (18) direkt auf die Rückwand (40) treffen oder einer einmaligen Reflexion an der Vorderwand (48) folgen.
3. Beleuchtungs- und/oder Signalisierungs Vorrichtung (4) nach Anspruch 2, wobei der Lichtleiter (24) eine Länge aufweist, die kürzer als 50 mm ist.
4. Beleuchtungs- und/oder Signalisierungs Vorrichtung (4) nach Anspruch 1, 2 oder 3, wobei die Polylinie zwei aufeinanderfolgende, geradlinige zueinander abgewinkelte Abschnitte (56) umfasst, die im Scheitelpunkt auf der Seite der LED-Lichtquelle (16) einen Winkel von mehr als 180 Grad bilden.
5. Beleuchtungs- und/oder Signalisierungs Vorrichtung (4) nach Anspruch 1, 2, 3 oder 4, wobei die Polylinie mindestens einen geradlinigen Abschnitt (56) und einen krummlinigen Abschnitt (56) umfasst, die aufeinanderfolgen, so dass auf der Seite der mindestens einen Lichtquelle (16) eine insgesamt konvexe Polylinie entsteht.
6. Beleuchtungs- und/oder Signalisierungs Vorrichtung (4) nach einem der Ansprüche 1 bis 5, wobei die Polylinie mindestens zwei aufeinanderfolgende krummlinige Abschnitte (56) umfasst, so dass auf der Seite der mindestens einen Lichtquelle (16) eine insgesamt konvexe Polylinie entsteht.
7. Beleuchtungs- und/oder Signalisierungs Vorrichtung (4) nach einem der Ansprüche 1 bis 6, wobei eine Querdicke (60) des Lichtleiters (24) gleich einer Querdicke (64) an den Querenden (66, 68) der Polylinie ist.
8. Beleuchtungs- und/oder Signalisierungs Vorrichtung

(4) nach Anspruch 7, wobei ein Lichtemissionsabschnitt (72) der Lichtquellen (16) eine Queramplitude (76) aufweist, die gleich der Querdicke (60) des Lichtleiters (24) ist.

9. Beleuchtungs- und/oder Signalisierungsvorrichtung (4) nach einem der Ansprüche 1 bis 8, wobei der Lichtleiter (24) an der Einlasswand (36) ein Paar quer verlaufender Fortsätze (80) auf gegenüberliegenden Seiten des Mittelabschnitts (52) mit Polyliniengeometrie aufweist. 5
10. Beleuchtungs- und/oder Signalisierungsvorrichtung (4) nach einem der Ansprüche 1 bis 9, wobei jede Schürze der Einlasswand (36) entlang einer Längsrichtung (L-L), senkrecht zur Querrichtung (T-T) und zur Hauptausbreitungsrichtung (X-X), eine Vielzahl nebeneinander liegender Optiken (84) umfasst, wobei die Optiken (84) ein "V"- oder "U"-Profil aufweisen, dessen Scheitelpunkt der Lichtquelle (16) zugewandt ist. 10
11. Beleuchtungs- und/oder Signalisierungsvorrichtung (4) nach Anspruch 10, wobei sich jede Schürze der Einlasswand (36) wellenförmig entlang der Längsrichtung (L-L) erstreckt. 20
12. Beleuchtungs- und/oder Signalisierungsvorrichtung (4) nach Anspruch 10 oder 11, wobei die Optik (84) entlang der Längsrichtung (L-L) gemäß einem kontinuierlichen sinusförmigen Muster angeordnet ist, das abwechselnde Erhöhungen (88) und Vertiefungen (92) mit einem konstanten Abstand (96) umfasst. 25
13. Beleuchtungs- und/oder Signalisierungsvorrichtung (4) nach Anspruch 12, wobei die Teilung (96) und die Geometrie der Optik (84) so konfiguriert sind, dass der von jeder Lichtquelle emittierte Lichtstrahl auf zwei oder mehr aufeinanderfolgende Erhöhungen (88) oder Vertiefungen (92) der Optik (84) trifft. 30
14. Beleuchtungs- und/oder Signalisierungsvorrichtung (4) nach Anspruch 10, 11, 12 oder 13, wobei die Optik (84) eine Höhe, d. h. einen Abstand zwischen den Erhöhungen (88) und den Vertiefungen (92), aufweist, der weniger als 1 mm beträgt. 35
15. Beleuchtungs- und/oder Signalisierungsvorrichtung (4) nach einem der Ansprüche 1 bis 14, wobei eine erste Schürze (56') der Einlasswand (36) so strukturiert ist, dass der Lichtstrahl in einer ersten proximalen Zone (100) der Rückwand (40) gebrochen und gelenkt wird, während eine zweite Schürze (56'') der Einlasswand (36) so strukturiert ist, dass der Lichtstrahl in einer zweiten distalen Zone (102) der Rückwand (40) gebrochen und gelenkt wird, sodass die gesamte Rückwand (40) einbezogen ist, wobei die 40

erste proximale Zone (100) und die zweite distale Zone (102) aneinander angrenzen.

16. Beleuchtungs- und/oder Signalisierungsvorrichtung (4) nach einem der Ansprüche 1 bis 15, wobei die optischen Extraktionselemente (44) der Rückwand (40) optische Elemente, wie Zylinderoptiken oder Kissenoptiken oder dergleichen, und/oder Streuelemente, wie einen Prägeabschnitt und/oder einen geätzten Abschnitt, umfassen. 5

17. Beleuchtungs- und/oder Signalisierungsvorrichtung (4) nach einem der Ansprüche 1 bis 16, wobei die Vorderwand (48) des Lichtleiters (24) Streuelemente und/oder einen geprägten Abschnitt und/oder einen geätzten Abschnitt umfasst. 10

Revendications

1. Dispositif d'éclairage et/ou de signalisation (4) pour véhicules, comprenant :

- un corps de récipient (8) qui délimite un siège de confinement (12) qui s'étend le long d'un premier bord périphérique (28), fermé par un corps lenticulaire (20) qui s'étend le long d'un second bord périphérique (32) au moins partiellement en forme de contre-forme et chevauchant ledit premier bord périphérique (28),
- ledit siège de confinement (12) logeant au moins une source lumineuse à DEL ou mini DEL (16) adaptée pour émettre un faisceau lumineux comprenant une pluralité de rayons lumineux (18) qui s'étendent le long d'un axe principal de propagation optique (X-X), et au moins un guide lumineux (24) configuré pour recevoir au moins partiellement lesdits rayons lumineux (18) au niveau de sa paroi d'entrée (36) et pour transmettre et/ou réfléchir lesdits rayons lumineux (18) sur sa paroi arrière (40),
- ladite paroi arrière (40) étant pourvue d'une pluralité d'éléments extracteurs optiques (44) qui extraient les rayons lumineux (18) et les transmettent extérieurement au guide lumineux (24) à travers une paroi avant (48) du guide lumineux (24), opposée à ladite paroi arrière (40), le long d'une direction transversale (T-T), perpendiculaire à l'axe principal de propagation optique (X-X),
- **caractérisée en ce que**, par rapport à un plan de section transversale passant par ledit axe principal de propagation optique (X-X) et ladite direction transversale (T-T), ladite paroi d'entrée (36) présente une section médiane (52) à géométrie polyligne comprenant une pluralité de sections rectilignes et/ou de sections curvilignes (56) de manière à être globalement convexe du 50

- côté de l'au moins une source lumineuse (16), dans lequel les sections rectilignes et/ou curvilignes (56) identifient chacune une jupe de la paroi d'entrée (36), dans lequel les jupes adjacentes de la paroi d'entrée (36) sont inclinées et reliées l'une à l'autre au niveau d'une ligne de sommet.
2. Dispositif d'éclairage et/ou de signalisation (4) selon la revendication 1, dans lequel ladite polyligne est configurée de sorte que les rayons lumineux (18), introduits par la paroi d'entrée (36) du guide lumineux (24), frappent directement la paroi arrière (40) ou suivent une réflexion unique sur la paroi avant (48).
 3. Dispositif d'éclairage et/ou de signalisation (4) selon la revendication 2, dans lequel le guide lumineux (24) a une longueur inférieure à 50 mm.
 4. Dispositif d'éclairage et/ou de signalisation (4) selon la revendication 1, 2 ou 3, dans lequel ladite polyligne comprend deux sections rectilignes consécutives mutuellement angulaires (56) qui forment un angle au sommet supérieur à 180 degrés, du côté de la source lumineuse à DEL (16).
 5. Dispositif d'éclairage et/ou de signalisation (4) selon la revendication 1, 2, 3 ou 4, dans lequel ladite polyligne comprend au moins une section rectiligne (56) et une section curviligne (56) qui sont consécutives l'une à l'autre de manière à obtenir une polyligne convexe globale du côté de l'au moins une source lumineuse (16).
 6. Dispositif d'éclairage et/ou de signalisation (4) selon l'une quelconque des revendications 1 à 5, dans lequel ladite polyligne comprend au moins deux sections curvilignes consécutives (56) de manière à obtenir une polyligne convexe globale du côté de l'au moins une source lumineuse (16).
 7. Dispositif d'éclairage et/ou de signalisation (4) selon l'une quelconque des revendications 1 à 6, dans lequel une épaisseur transversale (60) du guide lumineux (24) est égale à un cordon sous-tendu (64) aux extrémités transversales (66, 68) de ladite polyligne.
 8. Dispositif d'éclairage et/ou de signalisation (4) selon la revendication 7, dans lequel une partie d'émission lumineuse (72) desdites sources lumineuses (16) a une amplitude transversale (76) égale à ladite épaisseur transversale (60) du guide lumineux (24).
 9. Dispositif d'éclairage et/ou de signalisation (4) selon l'une quelconque des revendications 1 à 8, dans lequel le guide lumineux (24) a, au niveau de la paroi d'entrée (36), une paire d'appendices transversaux (80), sur les côtés opposés de ladite section centrale (52) à géométrie polyligne.
 10. Dispositif d'éclairage et/ou de signalisation (4) selon l'une quelconque des revendications 1 à 9, dans lequel chaque jupe de la paroi d'entrée (36) comprend une pluralité d'optiques adjacentes (84) le long d'une direction longitudinale (L-L), perpendiculaire à la direction transversale (T-T) et à la direction principale de propagation optique (X-X), lesdites optiques (84) ayant un profil en forme de « V » ou de « U » avec le sommet orienté vers la source lumineuse (16).
 11. Dispositif d'éclairage et/ou de signalisation (4) selon la revendication 10, dans lequel chaque jupe de la paroi d'entrée (36) s'étend de manière ondulée le long de la direction longitudinale (L-L).
 12. Dispositif d'éclairage et/ou de signalisation (4) selon l'une quelconque des revendications 10 ou 11, dans lequel lesdites optiques (84) sont disposées le long de la direction longitudinale (L-L) selon un motif sinusoïdal continu comprenant une alternance de crêtes (88) et de dépressions (92), à un pas constant (96).
 13. Dispositif d'éclairage et/ou de signalisation (4) selon la revendication 12, dans lequel le pas (96) et la géométrie de l'optique (84) sont configurés de manière à ce que le faisceau lumineux émis par chaque source lumineuse frappe au moins deux crêtes (88) ou dépressions (92) consécutives de l'optique (84).
 14. Dispositif d'éclairage et/ou de signalisation (4) selon la revendication 10, 11, 12 ou 13, dans lequel lesdites optiques (84) ont une hauteur, c'est-à-dire une distance entre les crêtes (88) et les dépressions (92), qui est inférieure à 1 mm.
 15. Dispositif d'éclairage et/ou de signalisation (4) selon l'une quelconque des revendications 1 à 14, dans lequel une première jupe (56') de la paroi d'entrée (36) est structurée pour réfracter et diriger le faisceau lumineux dans une première zone proximale (100) de la paroi arrière (40), tandis qu'une seconde jupe (56'') de la paroi d'entrée (36) est structurée pour réfracter et diriger le faisceau lumineux dans une seconde zone distale (102) de la paroi arrière (40), de manière à impliquer l'ensemble de la paroi arrière (40), ladite première zone proximale (100) et ladite seconde zone distale (102) étant contiguës l'une à l'autre.
 16. Dispositif d'éclairage et/ou de signalisation (4) selon l'une quelconque des revendications 1 à 15, dans lequel lesdits éléments extracteurs optiques (44) de

la paroi arrière (40) comprennent des éléments optiques, tels qu'une optique cylindrique ou une optique en forme de coussin ou similaire, et/ou des éléments de diffusion, tels qu'une partie embossée et/ou une partie gravée.

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17. Dispositif d'éclairage et/ou de signalisation (4) selon l'une quelconque des revendications 1 à 16, dans lequel ladite paroi frontale (48) du guide lumineux (24) comprend des éléments de diffusion et/ou une partie en relief et/ou une partie gravée.

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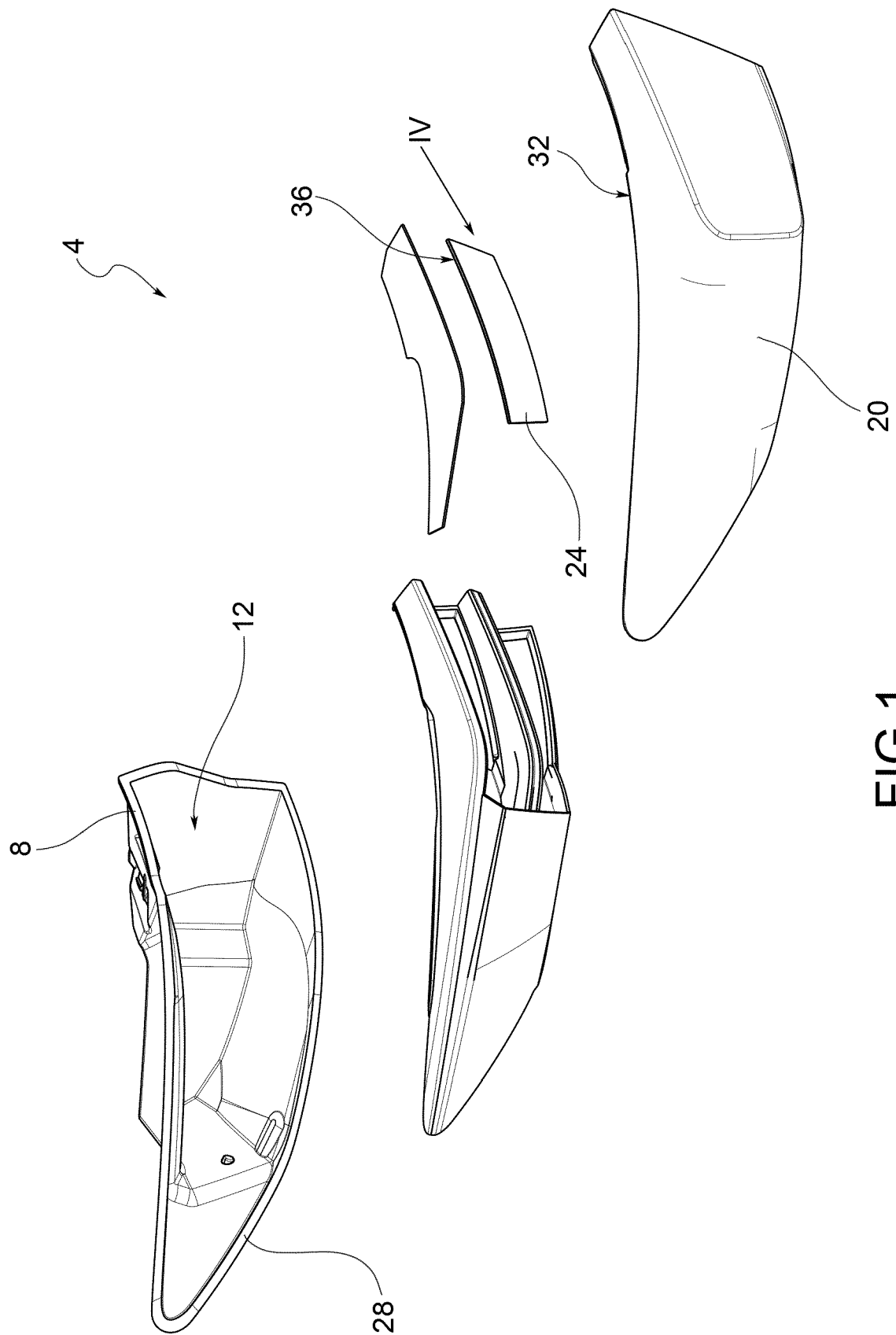


FIG. 1

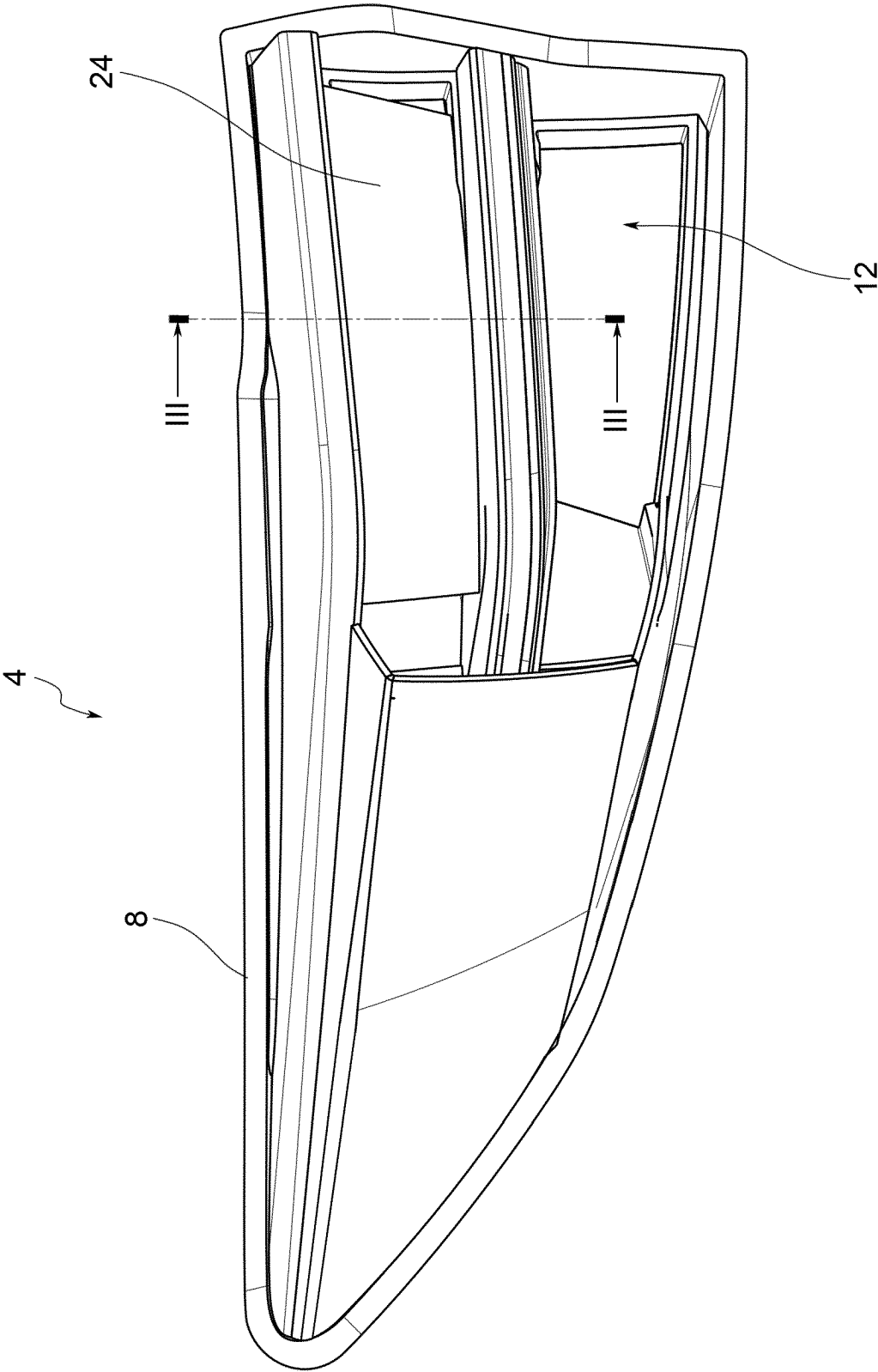


FIG. 2

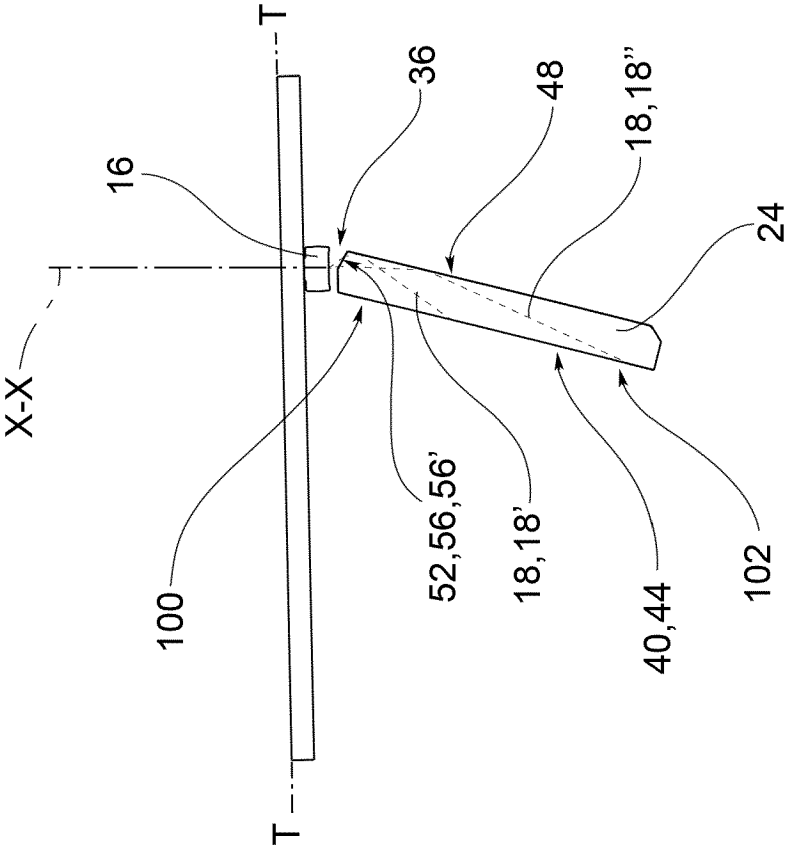


FIG.3a

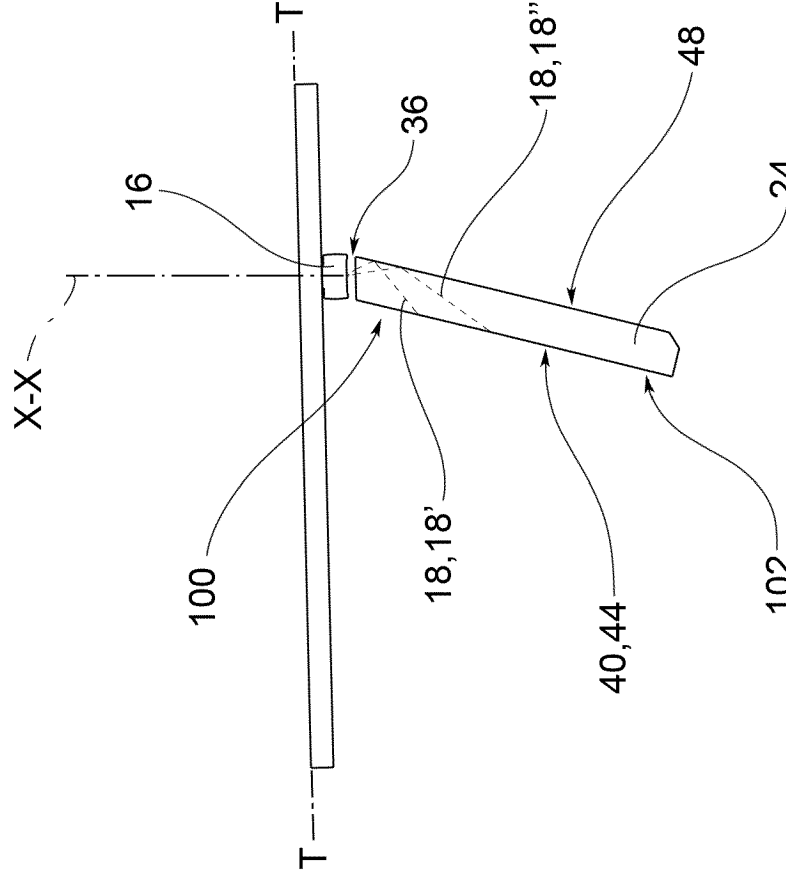


FIG.3b

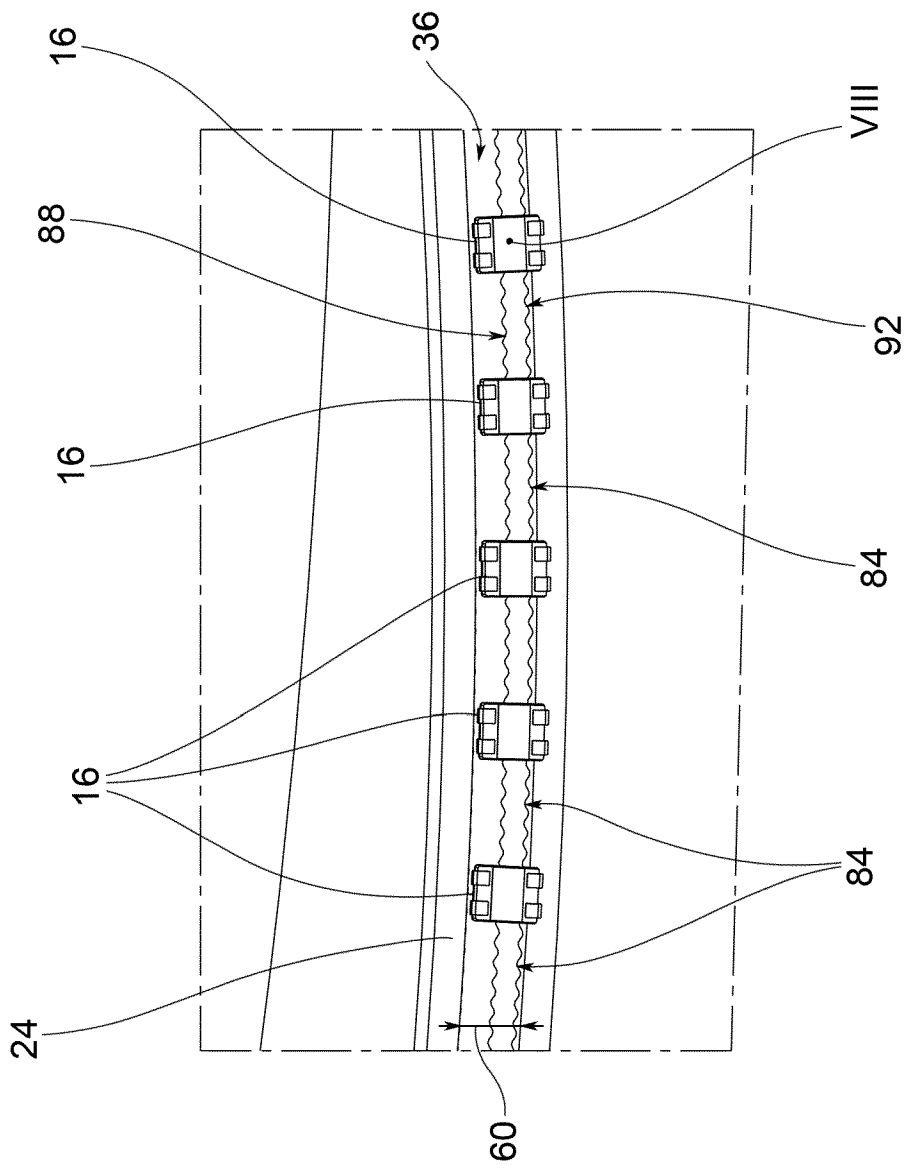


FIG. 5

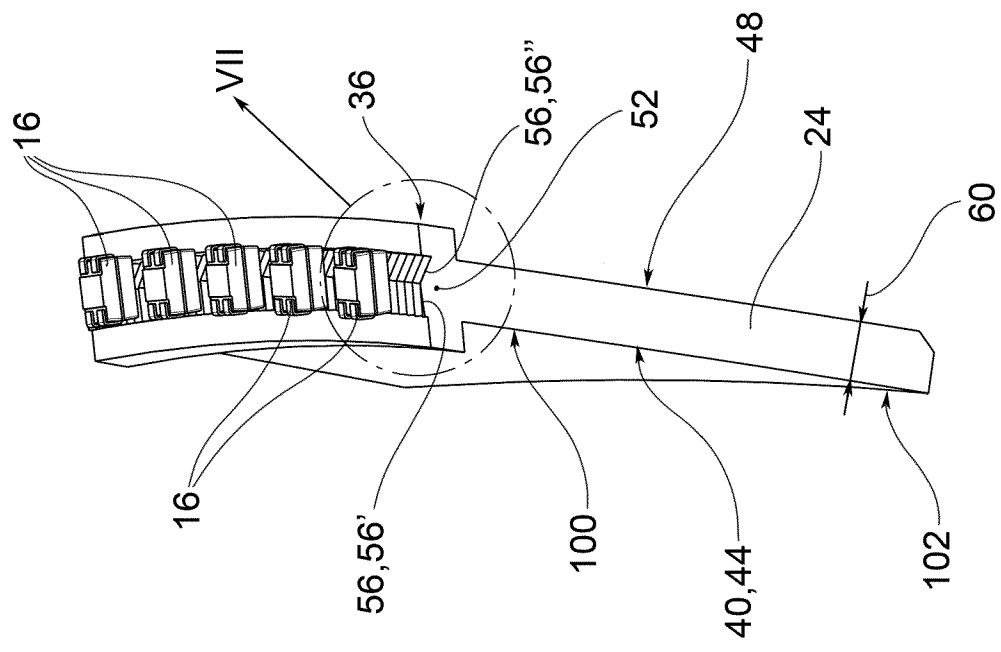
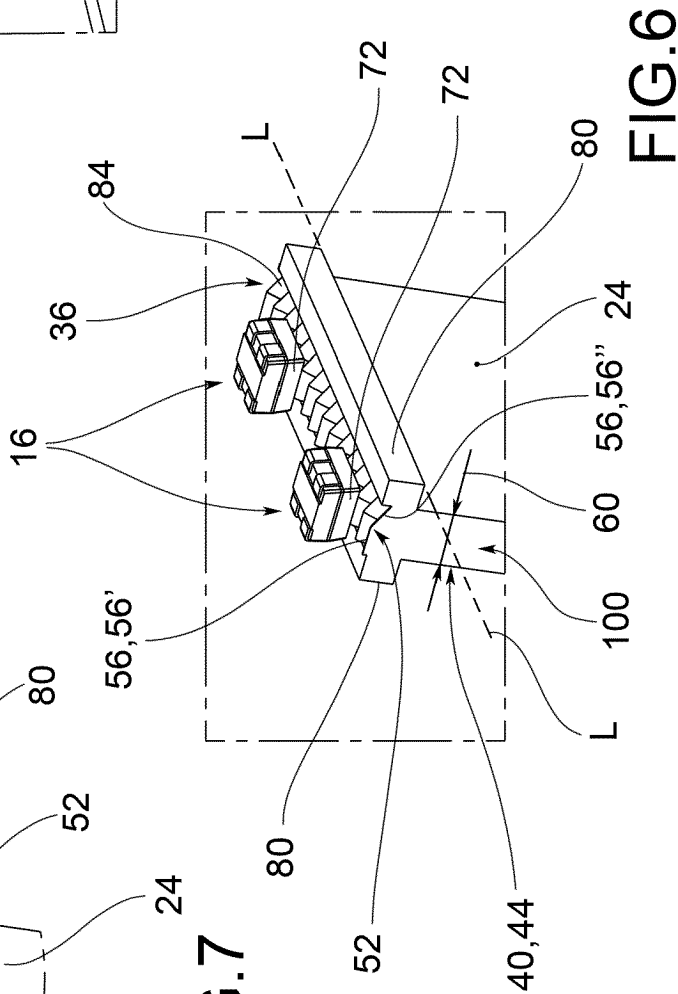
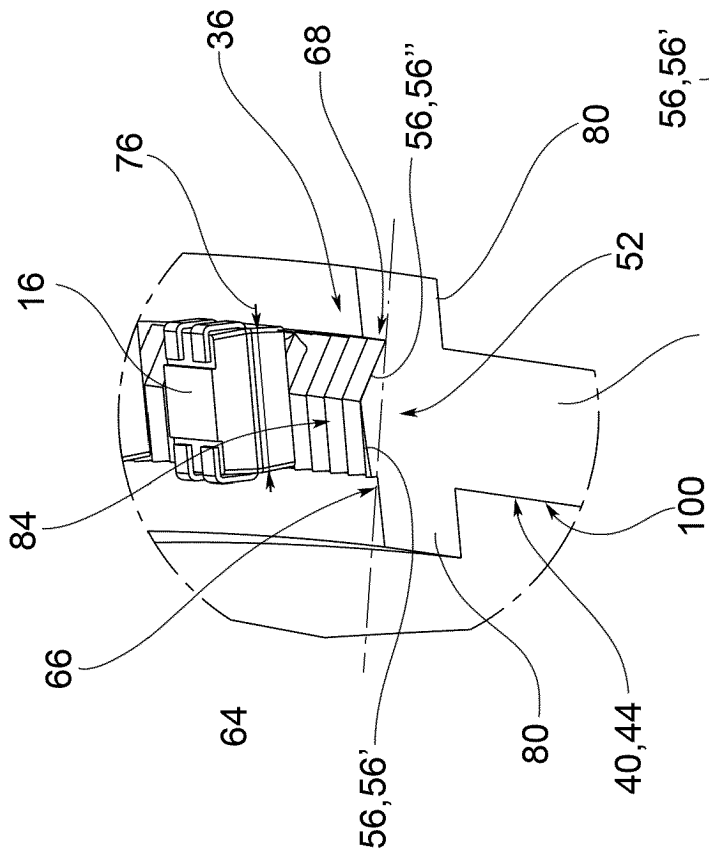
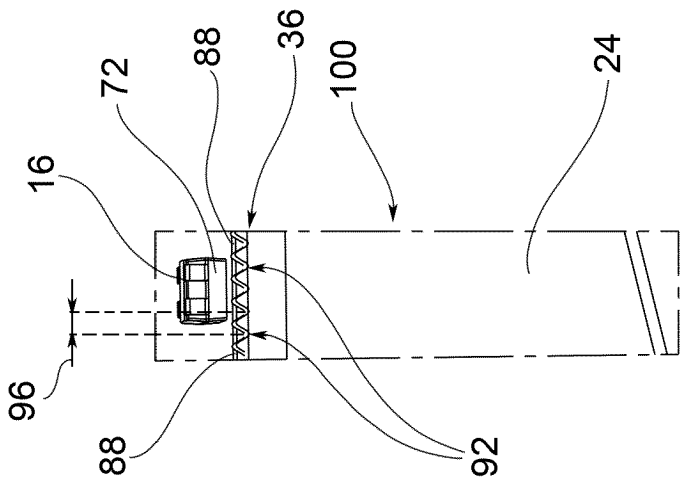


FIG. 4



REFERENCES CITED IN THE DESCRIPTION

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