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(54) Title: SYSTEM FOR ASSEMBLING LUMINOUS MODULAR ELEMENTS

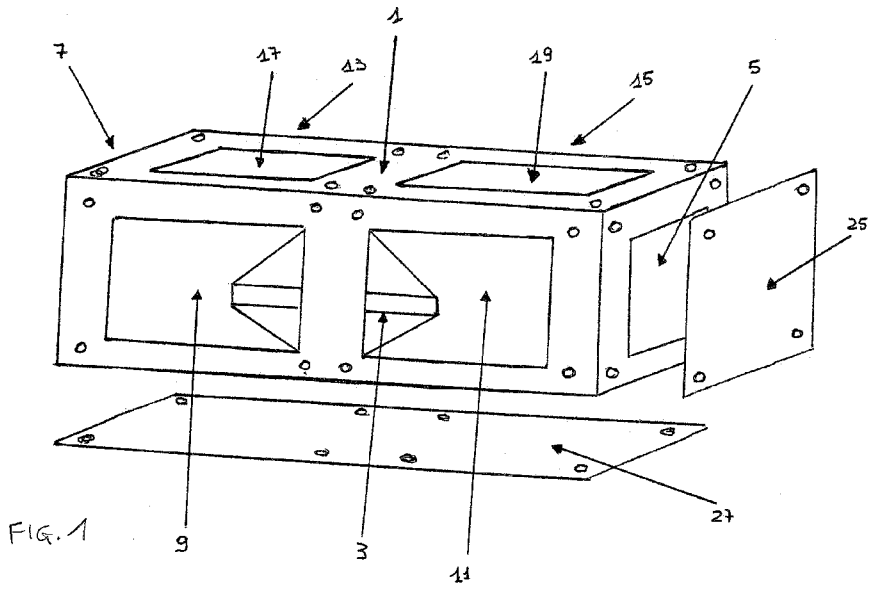

FIG. 1

(57) Abstract: A system for assembling luminous modular elements is described, which is composed of a luminous modular element (1) composed of an external supporting casing equipped with at least two sides with windows adapted to be coupled with similar sides of other luminous modular elements (1) and containing therein a lighting element (3), such luminous modular element (1) being adapted to be assembled with other luminous modular elements (1) directly in different geometric figures, also in angled configurations and without visible junctions or other materials.

SYSTEM FOR ASSEMBLING LUMINOUS MODULAR ELEMENTS

The present invention refers to a system for assembling luminous modular elements.

In particular, the invention deals with the field of bodies lighted with LED lamps aimed to save energy and to be flexible to use.

In the market of LED-lighted bodies, there are several apparatuses, also of the modular type, but with standardized features and developments; some shapes and applications which are described in the present invention are not provided and not even adapted to be built with current application criteria.

The existing systems with horizontal development, which cannot be overlapped or flanked, can be approached one to the other, but not integrated. The surfaces of existing systems are anyway limited as regards their geometric shapes and cannot have a horizontal, lateral, vertical, side, plane or length continuity like the system of the present invention.

Object of the present invention is solving the above prior art problems, by providing a system for assembling luminous modular elements which allows making any possible configuration and geometric shape, in a simple, easy and inexpensive way.

The above and other objects and advantages of the invention, as will appear from the following description, are obtained with a system for assembling luminous modular elements as claimed in claim 1. Preferred embodiments and non-trivial variations of the present invention are the subject matter of the dependent claims.

It is intended that all enclosed claims are an integral part of the present description.

The present invention will be better described by some preferred embodiments thereof, provided as a non-limiting example, with reference to the enclosed drawings, in which:

- Figure 1 is a view of an embodiment of the system according to the present invention;
- Figure 2 is a right-angle configuration of the inventive system;
- Figure 3 is a frame-angle configuration of the inventive system;
- Figure 4 is a vertical overlapped configuration

of the inventive system;

- Figure 5 is a horizontal plane and side configuration of the inventive system;
- Figure 6 is a vertical projecting configuration of the inventive system;
- Figure 7 is a configuration of the gaskets of the inventive system;
- Figure 8 is a flanked configuration of the inventive system;
- Figure 9 is a configuration of the luminous element of the inventive system; and
- Figure 10 is a configuration of the windows of the inventive system.

With reference to the Figures, a preferred embodiment of the system for assembling luminous modular elements of the present invention is shown and described. It will be immediately obvious that numerous variations and modifications (for example related to shape, sizes, arrangements and parts with equivalent functionality) could be made to what is described, without departing from the scope of the invention as appears from the enclosed claims.

The system for assembling luminous modular elements of the present invention consists in building luminous elements 1, lighted with LEDs 3, approximately as big as a brick used in building constructions. The brick 1 has one window on its two minor surfaces (5 and 7) and two windows on its four major surfaces (9 and 11 front), (13 and 15 back), (17 and 19 above), (21 and 23 below) (see Figure 1). The windows (5 and 7), as can be seen in Figure 10, are computed so that the windows (5 and 7) on the minor part of the brick have the same sizes as the windows (9 and 11 front - 13 and 15 back). This solution allows composing the following shapes:

- plane angle (Figure 2)
- frame angle (Figure 3)
- vertically overlapped (Figure 4)
- vertically projecting (Figure 6)
- horizontally plane and side (Figure 5)
- flange (Figure 8)

The invention further provides for building the luminous element means 35 (see Figure 9) which allows completing assemblages like the one with vertically projecting development (Figure 6), or where it is necessary to have a dimension which

cannot be reached with the measures of the basic element 1.

The luminous element means 35 can be lighted or not at will. The closures (25 and 27) (see Figure 1) with adequate sizes will close the parts left free by the connections between elements 1.

This flexibility of use allows the product to be used in several applications, also outside the field of lighting only, such as for example the building of partitions or parts thereof, false luminous windows or whole domes.

The inventive system can further be used in the field of furnishing and of furniture production.

The LED lamps LED 3 provide the undoubted advantage of energy savings, of very low weight and of versatility in programming the switching on.

With suitable special surfaces, it is also possible to manually paint the bricks 1 as middle-aged windows.

The bricks 1 will be joined by inserts made of male/male polypropylene which will be housed with pressure in recesses die-cast on the bricks 1 and on the closures (female).

The connection will be made by using the small cables which will be supplied as equipment, and the LED lamp 3 will be placed inside on its own support. The luminous source 3 can have a variable power, and be equipped with electronic power supply and terminal boards (not shown).

The lighting body 1 can further contain the electronic emergency unit, both of the always-on type and of the emergency-on only type, on which decals can be applied if provided by standards in force.

The wirings contained inside will not be visible, since the surface of the brick (1) is provides as opal white or coloured. Necessary accessories will also be supplied for fastening to a wall and/or a ceiling, which will be composed of plates whose sizes are the same as of the closures (25 and 27) but made of white painted metal and equipped with slits for fastening.

Fastening to the luminous brick 1 will happen through the engagement of fixed fittings present on the plates of the female recess provided on the lighting body 1.

It will further be possible to provide the apparatus 1 with a gasket 29 (for windows 9 - 11-

13 - 15), with a gasket 31 (for windows 5 - 7) and with a gasket 33 (for windows 17 - 19 - 21 - 23), all made of polymers resisting to a temperature of 120° (see Figure 7), which will have, next to the fitting inserts, through-holes to allow assembling both the apparatuses (1), and with the closures (25 and 27).

The materials used for building brick (1) can be:

- thermoformed metacrylate
- extruded or opal die-cast polycarbonate
- polypropylene
- opal self-extinguishing polycarbonate

Their choice will be performed depending on the building process and on the use aims.

The inventive system could be equipped with a junction shape with male inserts inserted in female recesses die-cast directly on the lighting body, which allow a junction with continuity of material and lightness, while the windows allow the passage of cabling wires.

Finally, in the inventive system, the closures of the lighting bodies could be adapted to be

manually painted, by building them with opal methacrylate, plexiglass or other suitable materials, to form drawings which can be lighted to be used as decorations in furnishing for environments or for other uses.

CLAIMS

1. System for assembling luminous modular elements (1), characterized in that it is composed of at least one luminous modular element (1) composed of an external supporting casing equipped with at least two sides with windows adapted to be coupled with similar sides of other luminous modular elements (1) and containing therein at least one lighting element (3), said luminous modular element (1) being adapted to be assembled with other luminous modular elements (1) directly in different geometric figures, also in angled configurations and without visible junctions or other materials.

2. System according to claim 1, characterized in that said luminous modular elements (1) are shaped as a brick and said lighting elements (3) are of the LED type.

3. System according to claim 2, characterized in that each one of said luminous modular elements (1) has one window on its two minor surfaces (5 and 7) and two windows on its four major surfaces (9 and 11 in front), (13 and 15 in the back), (17 and 19 above), (21 and 23 below), said windows (5 and 7) being computed so that the windows (5 and 7) on the short part of the brick have the same sizes as of

the windows (9 and 11 in front - 13 and 15 in the back).

4. System according to claim 3, characterized in that it is adapted to compose at least one of the following figures:

- plane angle
- frame angle
- vertical overlapped
- vertical projecting
- horizontal plane and edge
- flanked.

5. System according to any one of the previous claims, characterized in that it is equipped with closures (25 and 27) adapted to close the parts left free from connections between the various elements (1).

6. System according to claim 5, characterized in that said luminous modular elements (1) are mutually joined by male/male inserts made of polypropilene which will be pressure-housed in recesses molded on the modular elements (1) and on the closures (female), the connection being performed by using small cables provided as equipment, while the LED lamp (3) is placed inside on its own support, the lighting source (3) having

a variable power, and being equipped with elctronic power supply and terminal board.

7. System according to any one of the previous claims, characterized in that each one of said luminous modular elements (1) contains an electronic emergency assembly, either of the always-on type or of the emergency-on-only type.

8. System according to any one of the previous claims, characterized in that it is further equipped with at least one gasket (29) for windows (9 - 11- 13 - 15), with at least one gasket (31) for windows (5 - 7) and with at least one gasket (33) for windows (17 - 19 - 21 - 23), all said gaskets (29, 31, 33) being made of polymers resisting to a temperature of 120°, which will be equipped, next to the connecting inserts, with through-holes to allow assembling both the elemente (1), and the closures (25 and 27).

9. System according to any one of the previous claims, characterized in that it is equipped with a junction shape with male inserts inserted in female recesses directly molded on the lighting body, which allow a continuous junction of material and brightness, while the windows allow wiring cables to pass therethrough.

10. System according to any one of the previous claims, characterized in that the closures of the lighting bodies are adapted to be manually painted, making them of opal metacrylate, plexiglass or other suitable materials, in order to form figures adapted to be lighted to be used as decorations in furniture for environments or other uses.

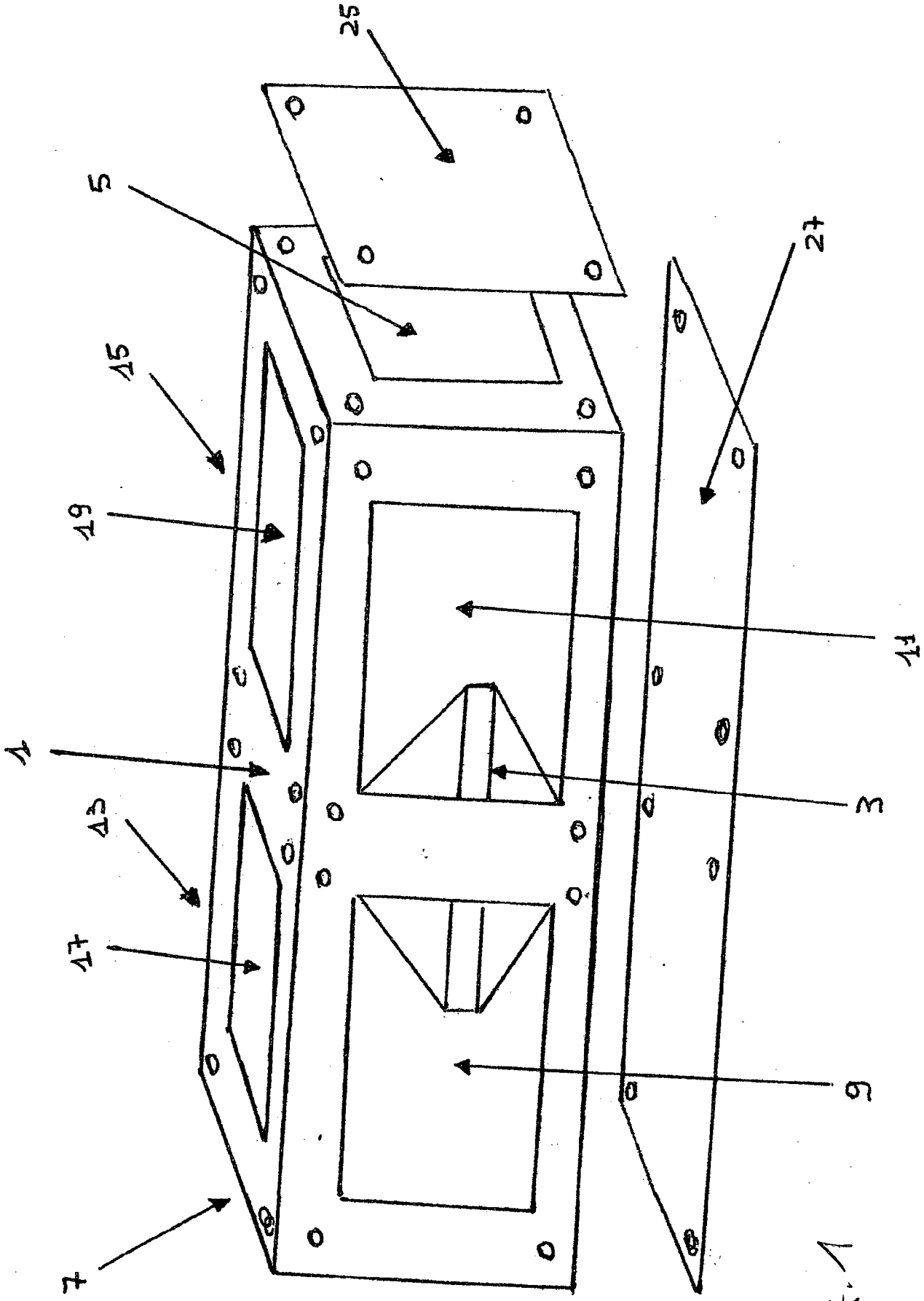

FIG. 1

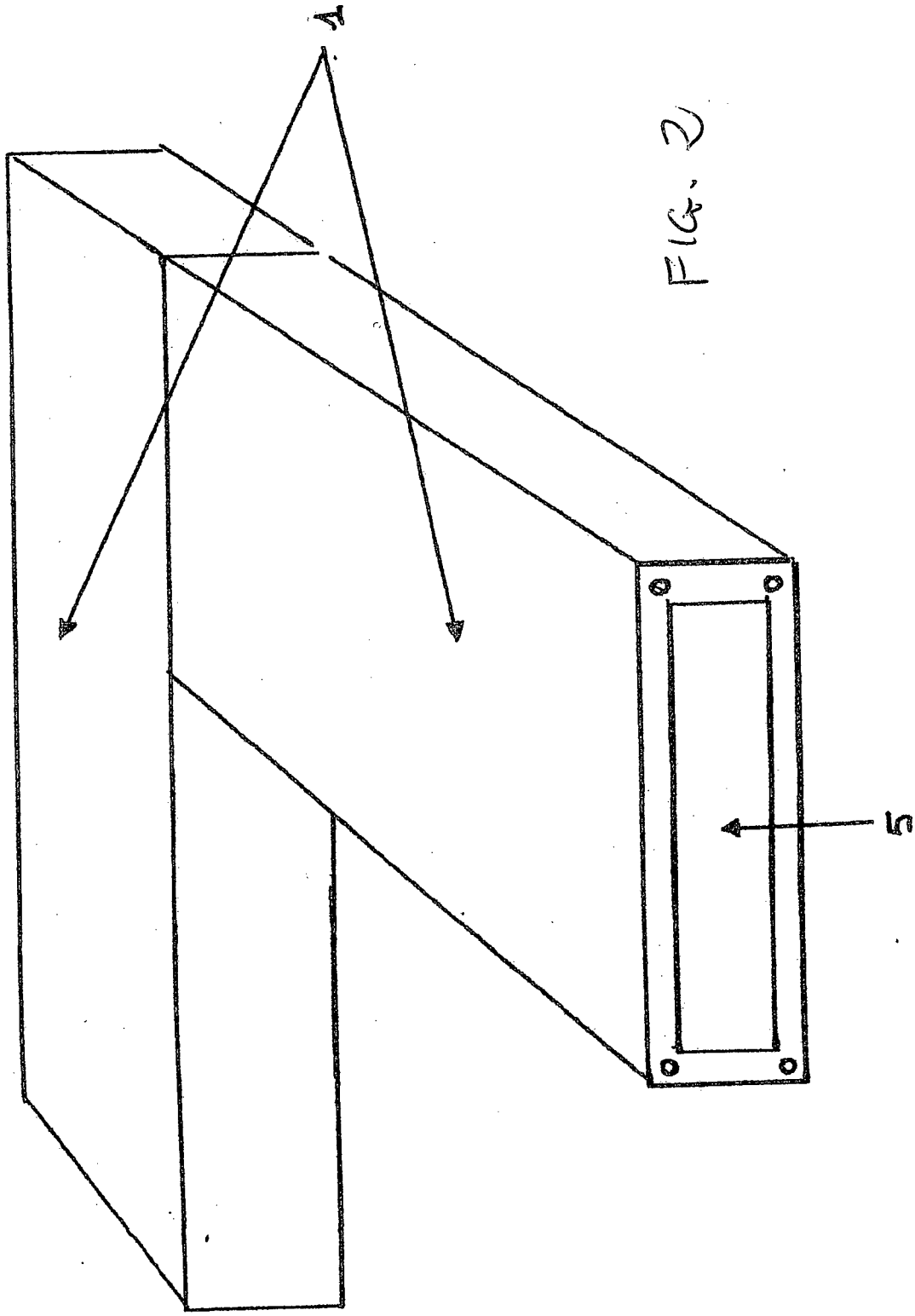

FIG. 2

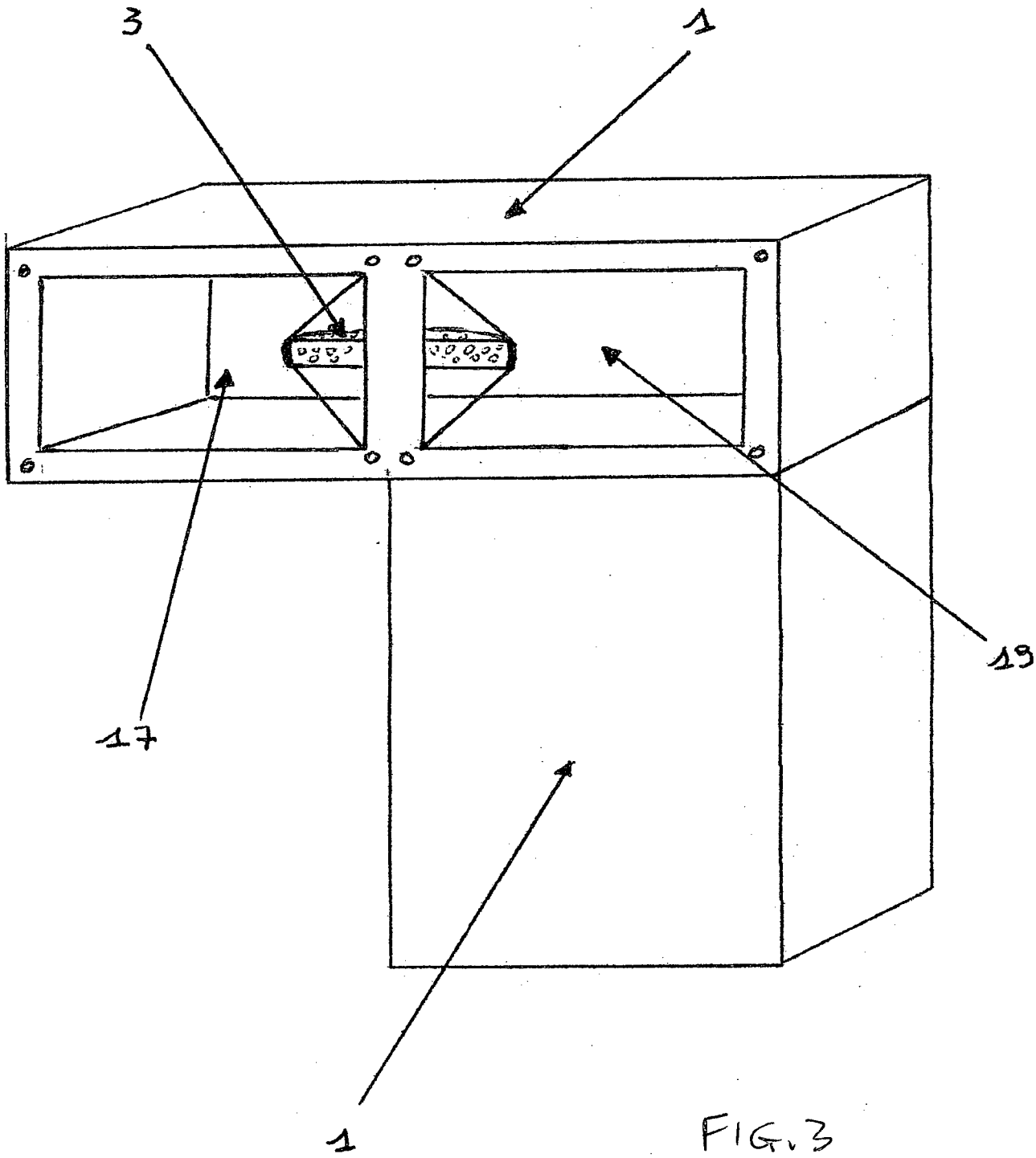

FIG. 3

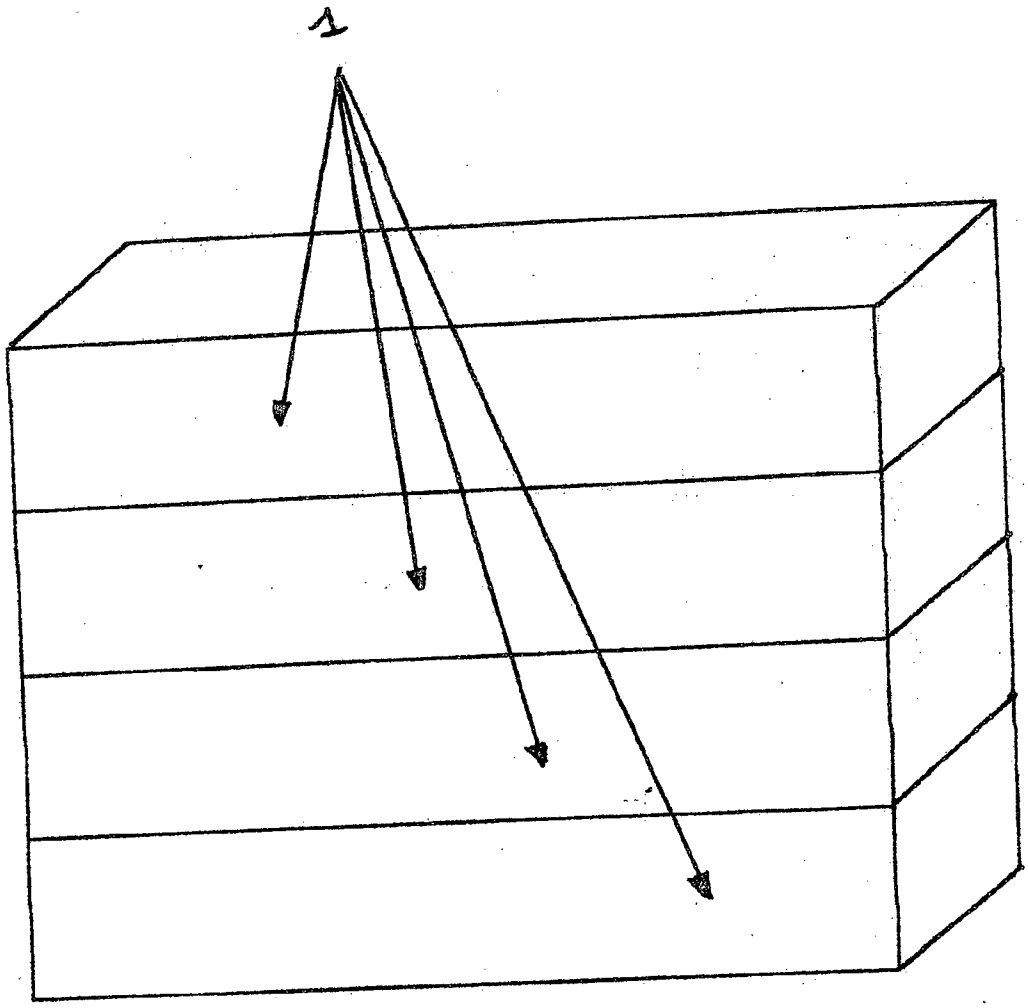

FIG. 4

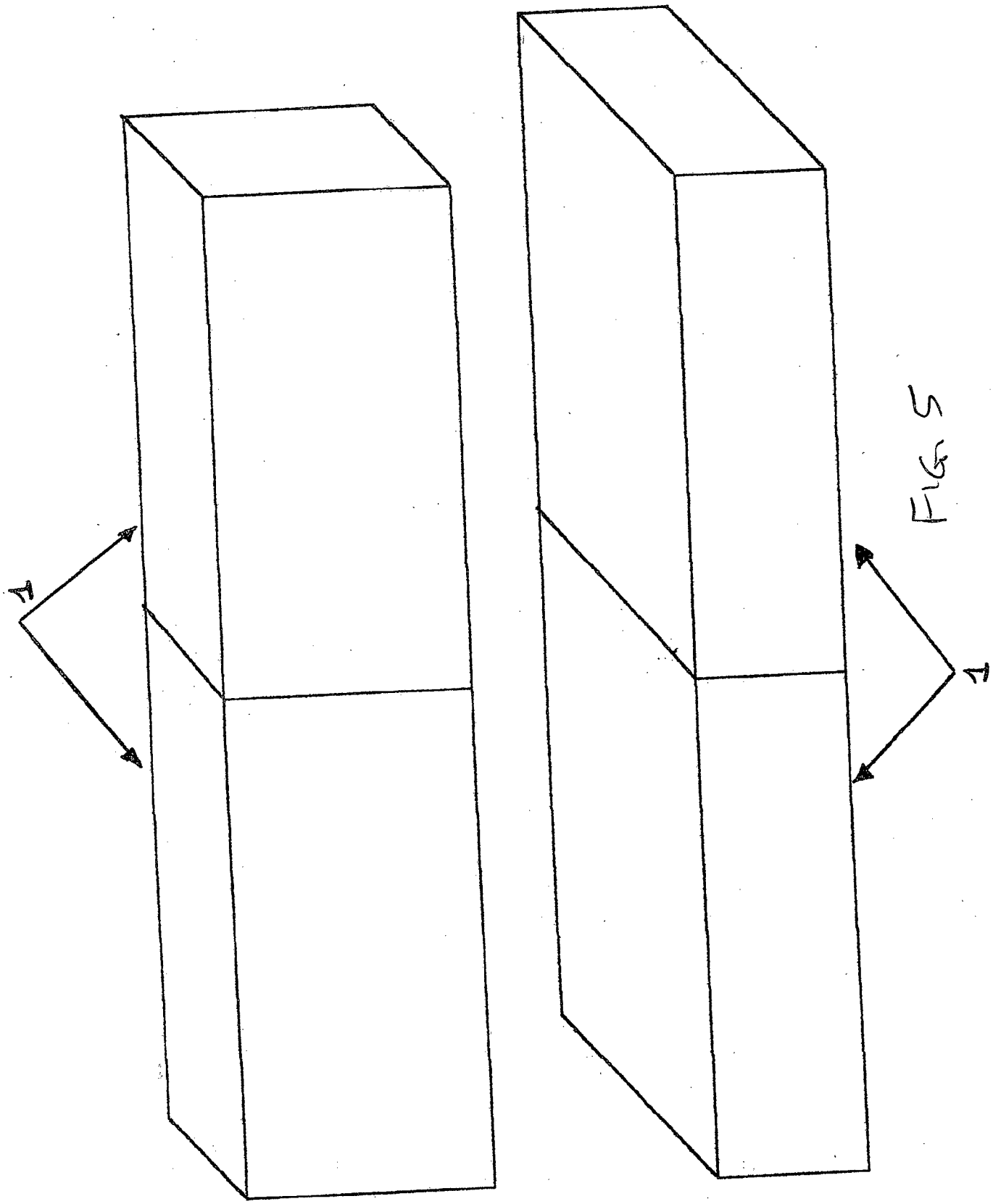

Fig 5

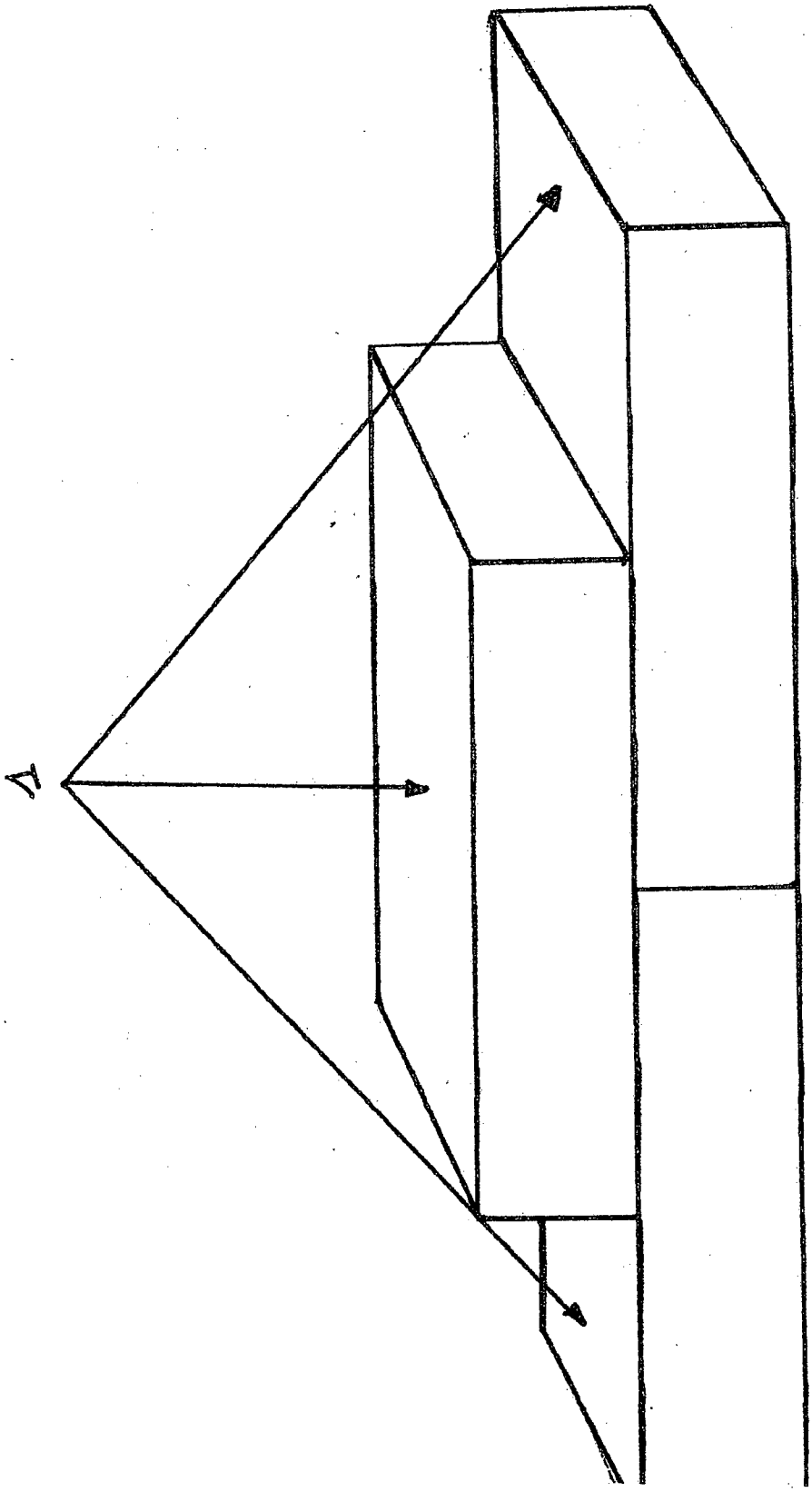

FIG. 6

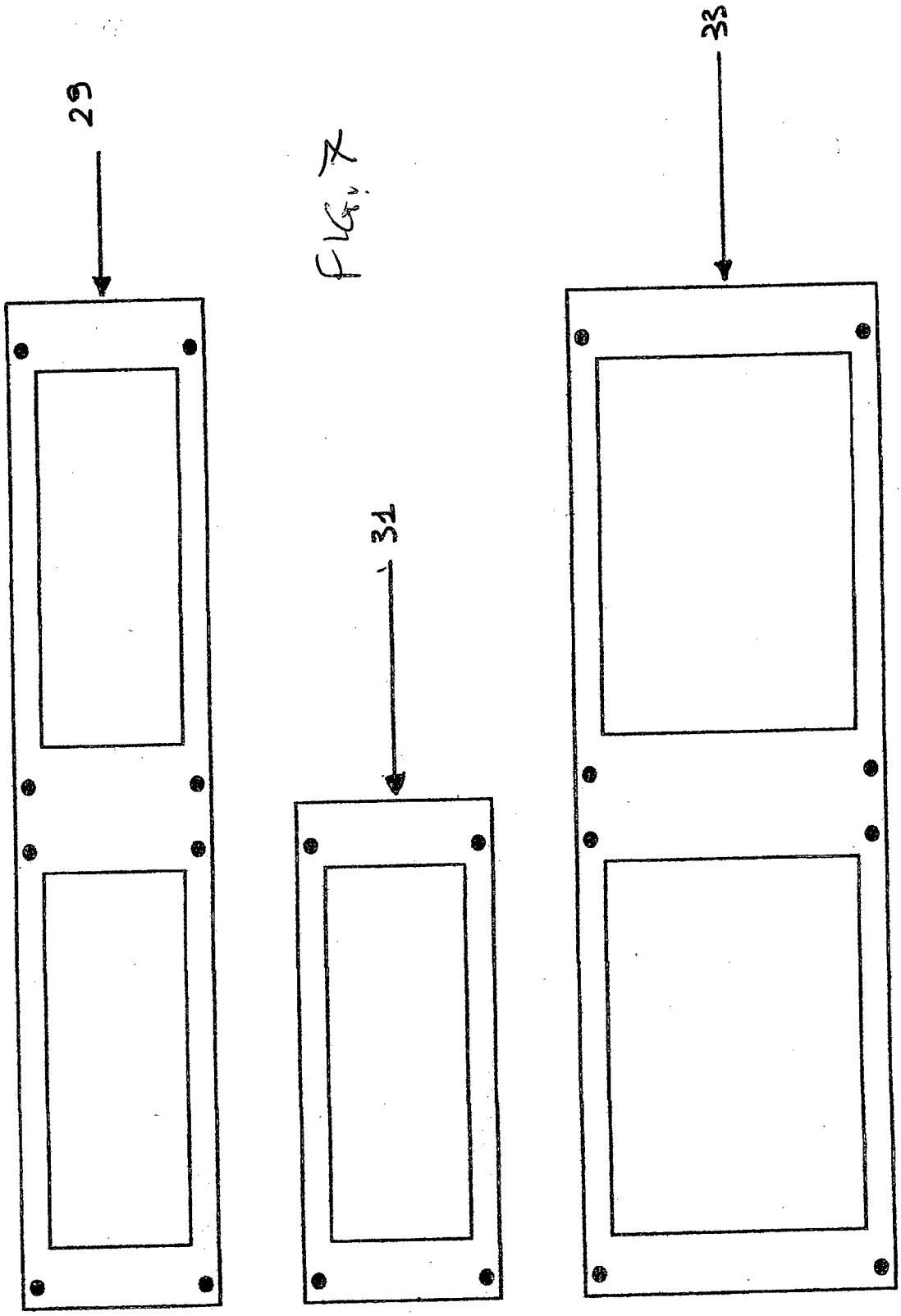

FIG. 7

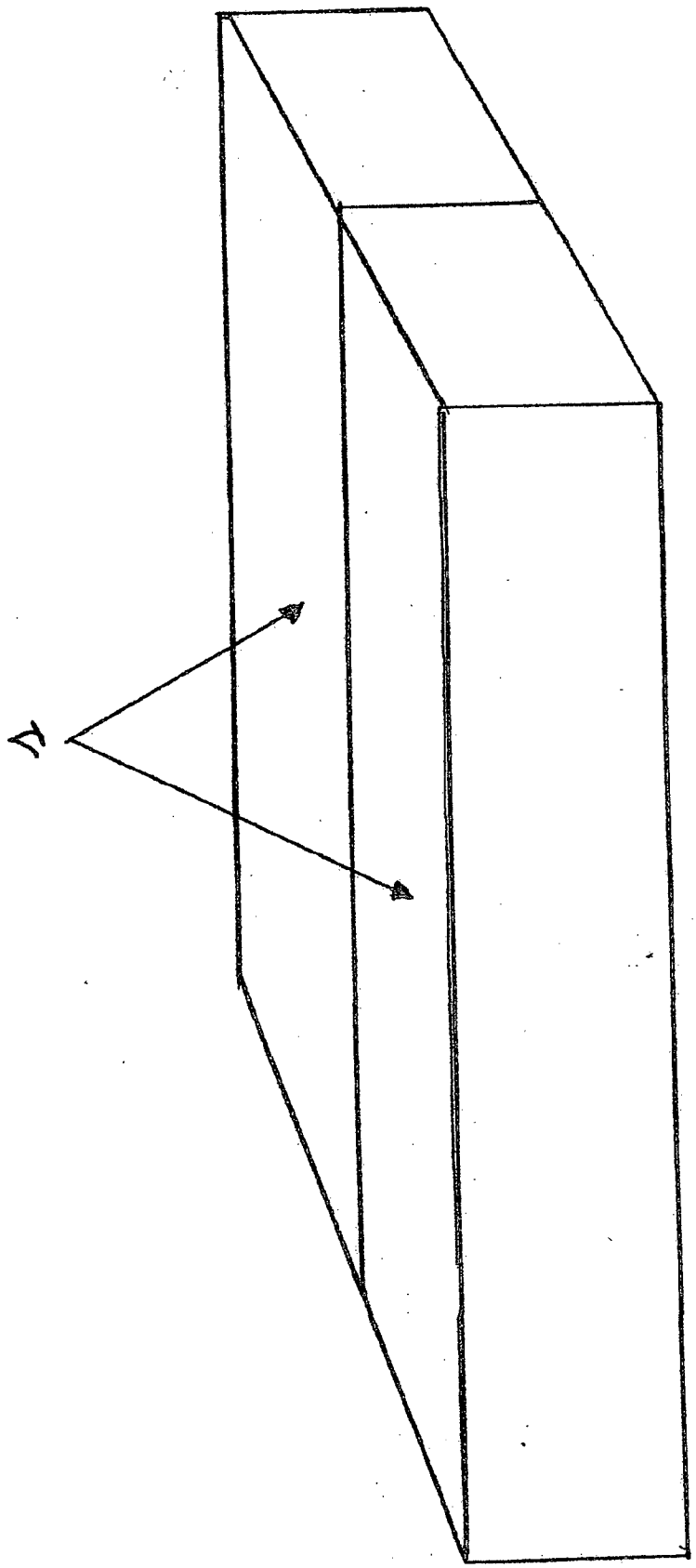

FIG. 8

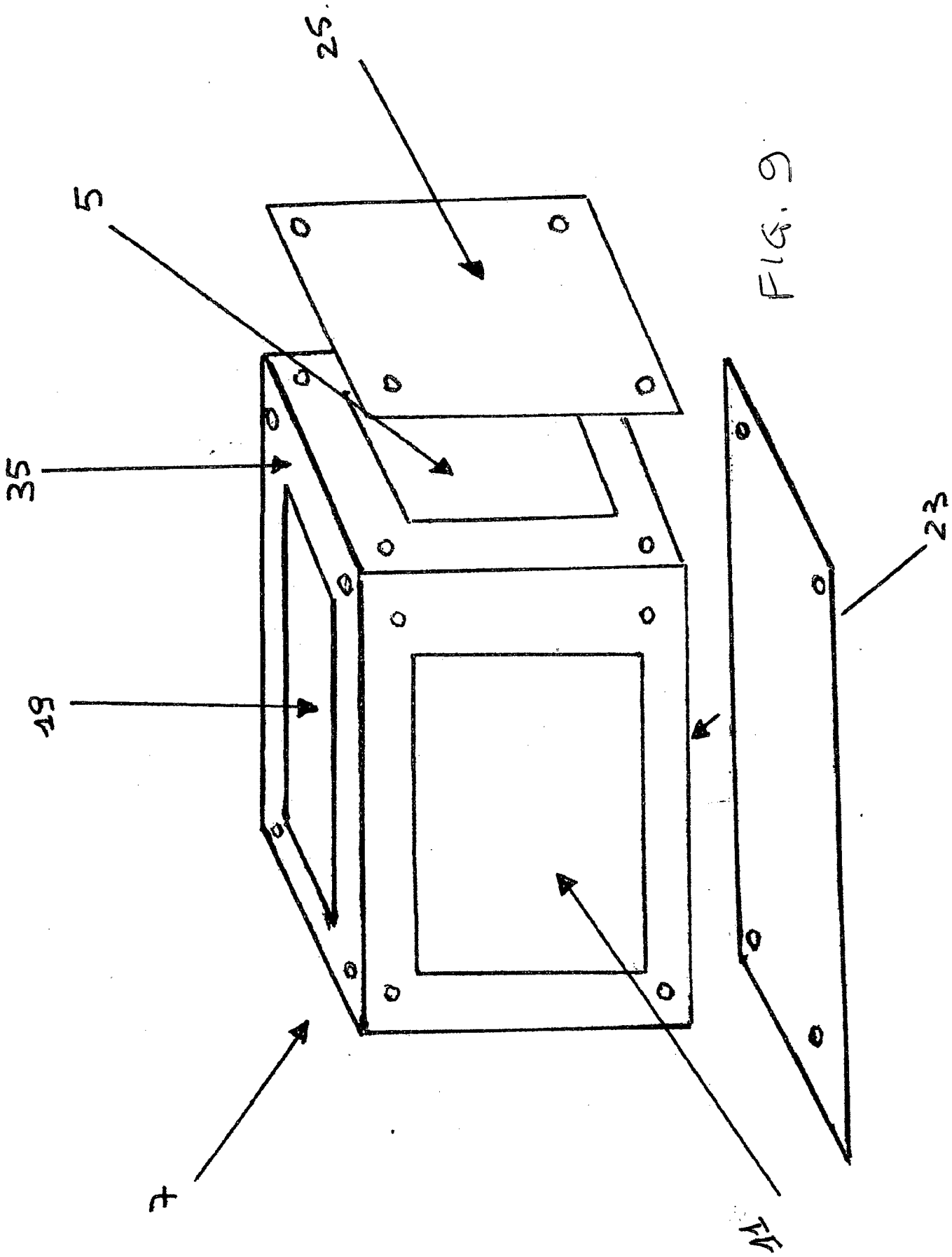

FIG. 9

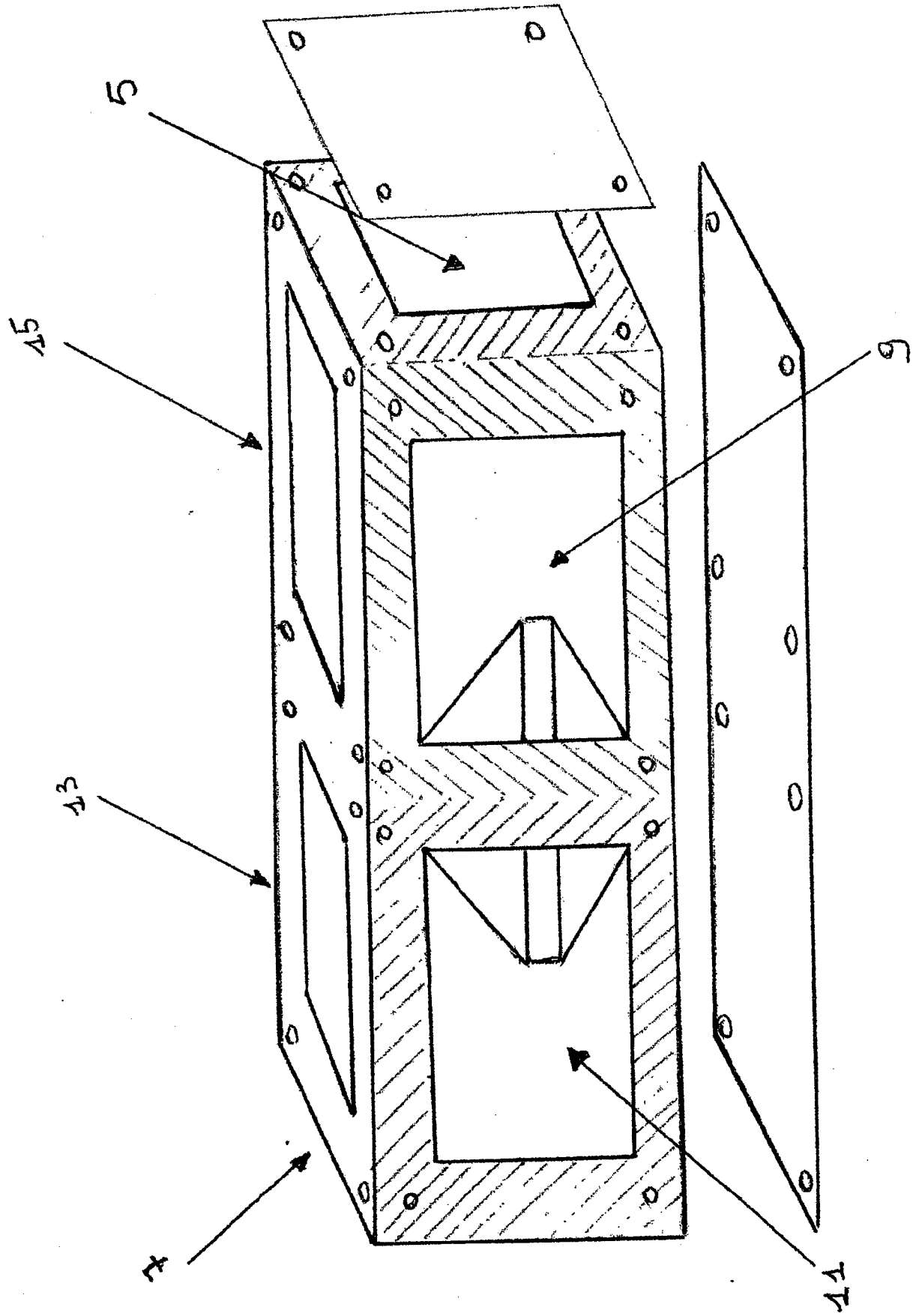

FIG. 10

INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2015/000125

A. CLASSIFICATION OF SUBJECT MATTER
INV. F21V33/00 F21S2/00 F21V15/01 F21V21/005
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F21V F21S F21W F21Y

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2006/044859 A2 (ROSE ART IND INC [US] MEGA BRANDS INTERNATIONAL LUXE [CH]) 27 April 2006 (2006-04-27) the whole document	1-10
X	US 2005/007780 A1 (FEUERBORN STEPHEN [US] ET AL) 13 January 2005 (2005-01-13) figures	1-10
X	DE 20 2007 001243 U1 (KRAHE JENS [DE]) 16 May 2007 (2007-05-16) figures 1-6	1-10
X	GB 2 465 339 A (NEVILL PAUL [GB]) 19 May 2010 (2010-05-19) figure 1	1-10

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 August 2015	27/08/2015

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Kebemou, Augustin

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2015/000125

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CH 693 242 A5 (NATANEL GLUSKA [CH]) 30 April 2003 (2003-04-30) figures 1,2 -----	1-10

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IT2015/000125

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		WO 2006044859 A2	27-04-2006
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CH 693242 A5	30-04-2003	NONE	