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(54) **Modular multifunctional antenna frame for an anti-shoplifting system**

(57) Modular multifunctional antenna frame for an anti-shoplifting system arranged to receive, at the user's choice, one or more modules, which afford to the antenna frame a functionality desired by the user. Preferably, the antenna frame has a base section provided with cover plates, which contains between the cover plates a hollow space for receiving one or more electronics modules.

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Description

[0001] The invention relates to a modular multifunctional antenna frame and to modules for use in such an antenna frame.

[0002] In many shops and department stores and the like, anti-shoplifting systems are used, whereby articles in the shop and the like are provided with a visible or invisible electronic and/or magnetic label. Upon regular purchase of such a labeled article, the label is removed and/or deactivated at the cash desk. To prevent articles being taken out without payment, so-called detection gates are disposed at the exits of the shop or the like. Such detection gates are usually formed by two frame antennas standing opposite each other, having between them a passageway to the environment outside the shopping area. In operation, a detection field prevails in the passageway, which allows detection of a label still attached to an article and/or not deactivated yet. If such a label is detected, the customer may be asked, by way of an alarm signal, such as for instance a beep signal, a ringing signal or a text sign lighting up, or the like, to have the label removed or deactivated at the cash desk.

[0003] The object of the invention is to further enlarge the possibilities of use and the convenience of use of such antennas for an anti-shoplifting system.

[0004] To this end, according to the invention, there is provided an antenna frame which is arranged to receive one or more modules, which afford to the antenna frame a functionality desired by the user.

[0005] In the following, the invention is further elucidated with reference to the appended drawing.

Fig. 1 schematically shows a few examples of antenna frames according to the invention;
Fig. 2 schematically illustrates how a particular module may be placed in an antenna frame;
Fig. 3 shows on a large scale the part of Fig. 2 that is designated by III;
Fig. 4 schematically shows a base section of an antenna frame with a module to be placed therein;
Fig. 5 shows the insertion of a back plate of a display plate in multilayer design into an upright of the antenna frame;
Fig. 6 shows the placement of a cover plate of a multilayer display plate on a poster;
Fig. 7 shows the edges and corners of the cover plate coinciding with the poster;
Fig. 8 shows the superposed poster and cover plate being arranged over the back plate already present; and
Fig. 9 shows how a last longitudinal edge of the cover plate is attached to the respective upright.

[0006] Fig. 1 schematically shows by way of example four multifunctional antenna frames 1, 2, 3, and 4 according to the invention.

[0007] The antenna frames are arranged for modular construction and can receive various modules, depending on the end user's wishes.

[0008] In the example shown, the antenna frames take the form of a column, built up from two uprights 5, 6, which, as desired, may be profiled in the longitudinal direction, by means of a profiled continuous cross section. At the bottom, the uprights are connected by a base section 7 and at the top the uprights are connected by a top plate 8, serving as upper bridge.

[0009] The base section 7 may be provided with a lower baseplate 9, serving as pedestal, a top part or upper baseplate 10, and two cover plates 11 serving as wall elements, one of which can be seen. The cover plates 11 are preferably simple to remove and to mount, respectively, for instance by means of a snap-fit system, and enclose a hollow space, in which electronic modules, as for an article surveillance system, may be accommodated.

[0010] The uprights 5, 6 are further connected by a number of crossbars 12. If desired, the top plate 8 and the baseplates 9 and 10 may also be arranged on such crossbars 12.

[0011] The thus formed antenna frame has hollow parts, comprising hollow uprights and one or more hollow crossbars and/or hollow top plates and baseplates, or hollow crossbars adjacent the top plates and/or baseplates.

[0012] The antenna frame is furthermore provided, preferably already so in standard designs, with wiring, which extends in or on the hollow parts for forming one or more antenna loops and providing supply energy and a signal connection for modules to be connected.

[0013] The antenna frame 2 is provided with a primary customer counting module 15, working for instance with infrared radiation, which can for instance cooperate with a complementary or secondary customer counting module arranged in an antenna frame placed opposite the respective antenna frame. Other examples of modules may be formed by a module for person identification and registration, for data storage of detected labels optionally in combination with a goods storage system.

[0014] Fig. 2 schematically shows how a module, such as customer counting module 15, may be assembled and Fig. 3 shows this customer counting module 15 on a larger scale. The customer counting module 15 has a shape such that the module fits precisely between the uprights 5 and 6, with the ends 16, 17 of the module partly embracing the uprights. Preferably, the ends 16, 17 fit to the uprights in a form-closing manner. Further, at the underside thereof, the module 15 shown has two springing clamping brackets 18, which can engage around the bar 12. The bar 12, as can be seen in Fig. 3, has one or more openings or recesses, in which one or more contacts 20 are situated, which are connected with wiring 21, 22. The module 15 is provided with corresponding contact elements 23, of which one is shown in Fig. 3.

[0015] The antenna frame 3 in Fig. 1 is provided on opposite sides with cover plates 25, which in this example

extend from the base section 7 up to the top plate 8. It is also possible that the cover plates extend only over a part of the height of an antenna frame and leave clear one or more open compartments 26 situated between the bars 12. It is also possible to arrange the cover plate 25, if desired, on one side of the antenna frame only.

[0016] The cover plates can be simply mounted and removed, for instance using a snap-fit system. The cover plates may be provided with scenes and/or colors desired by the user. The cover plates may also be provided with commercial information and/or notices for the visitors. For instance, on the cover plates, for instance particular articles from the store supply or from third parties may be advertised, or services offered by the shop organization or others.

[0017] The antenna frame indicated with reference numeral 4 is provided with a cover plate 25 on one side only. A cover plate situated on the side of an antenna frame remote from the passageway between two antenna frames may also serve as a shielding plate to bound the detection field.

[0018] Fig. 4 schematically shows a base section of an example of an antenna column according to the invention. The figure illustrates that a communication and control unit 30 can be placed in the base of an antenna column. The unit can preferably be mounted according to the "plug & play" system and may for instance be suitable for the EASi information exchange system for anti-shoplifting systems, marketed by applicant, whereby a number of the antennas are connected to a network, so that the information obtained from the antennas can be centrally collected, processed and managed. Such a unit can contain a modem and can for instance count the number of alarm signals, count the number of customers and the number of times that a label is deactivated at a cash desk. The unit can comprise an analog modem, or may be suitable for a LAN (local area network) connection, wired or wireless, or may be provided with a GSM/GPRS modem.

[0019] Fig. 4 at 31 further shows connecting means for the electronics to be inserted.

[0020] The user may, if desired, start with antenna frames that are designed only as carriers for, for instance, advertising expressions ("poster holder"), as indicated in Fig. 1 at 4. Later, for instance customer counting modules may be added. Since assembly is simple, this can be done by the user himself. Also, a matching unit with customer electronics then needs to be added. This can then be mounted in the base section. In principle, it is also possible to accommodate this electronics unit in the customer counting module.

[0021] Further, the user can add the anti-shoplifting function by mounting a suitable unit for electronic article surveillance, also EAS electronics unit, in the base of the antenna frame. Any customer electronics already present may then be canceled since the EAS electronics then fulfills this function.

[0022] The anti-shoplifting function may thereafter be expanded, if desired, to include a network function and remote control and maintenance. To this end, the EASi module already mentioned may be added.

[0023] The antenna frames are in principle connected to the usual supply voltage, but in principle it is possible for the various units or modules to be designed for battery supply.

[0024] The antenna frames 3 and 4 in Fig. 1 are provided with a cover plate 25 at least on one side. In order that the cover plates can be simply mounted and removed and be provided with, for instance, advertising posters, the cover plate is of multilayer design in an embodiment according to Figs. 5-9. In Fig. 5 it is shown how first a back plate 25A, following arrows 41, is inserted into a longitudinal groove of the profiled upright 5. In an enlarged detail in Fig. 5, it is indicated by means of arrows 43 how a vertical longitudinal edge on the left-hand side of the back plate 25A is slid into the longitudinal groove of the upright 5. The back plate 25A is then caused to bulge under its own resilience and inserted, by a right-hand side thereof, into an opposite groove in the other upright 6. Once inserted into both grooves, the back plate 25A will be held in place in slightly bulged condition under the influence of its own elastic tension. In Fig. 6 it can be seen how a cover plate 25B, following the arrows 45, is placed on a poster 33. Care is taken here, as can be seen in Fig. 7, that the edges and corners of the cover plate 25B and the poster 33 coincide.

[0025] Further, Figs. 6 and 7 show that the cover plate 25B is provided with beveled or cut-off, or possibly rounded, corner points 35, 37 situated at the top and bottom corner points of the right-hand vertical longitudinal side. Also, in the top and bottom edge, notches 51, 53 are provided. The beveled corner points 35, 37 (see also inset in Fig. 7) simplify the insertion of the cover plate 25B into the respective longitudinal groove of the profiled upright. The notches 51, 53 simplify removing the cover plate 25B for replacing the poster 33.

[0026] The superposed poster 33 and cover plate 25B are now, as shown in Fig. 8, moved over the back plate 25A, already present, into the longitudinal groove of the upright 5, in the direction of the arrows 47. In an inset of Fig. 8, this is further shown in more detail with the help of the arrows 49. Fig. 9, finally, shows how the opposite longitudinal edge of the cover plate 25B is inserted into the respective longitudinal groove of the upright 6. The cover plate 25B, too, supported by the back plate 25A already bent, then takes a bulged shape and is thereupon held in the opposite longitudinal grooves of the uprights 5, 6 by its own elasticity. The inset in Fig. 9 further shows how, from the right-hand top corner, the rest of the cover plate 25B can be pressed into the groove by movement of the hand from the top down (arrow 55). In this multilayer embodiment of the cover plate, it is advantageous when the back plate 25A, the poster 33 and the cover plate 25B are translucent. In this way, with lighting arranged within the frame openings 26 (see Fig. 5), particular attention may be drawn to the advertising messages that

may be present on the poster 33. It is then of further advantage if the cover plate 25A is moreover transparent. The bulged shape of the multilayer display plate 25A, 25B may further be supported by a corresponding shape of the module 15, or possibly by a correspondingly shaped crossbar 12 and/or the base top part 10.

[0027] It is noted that after the foregoing, various modifications will readily occur to those skilled in the art.

Claims

1. A modular multifunctional antenna frame for an antishoplifting system arranged to receive, at the user's choice, one or more modules, which afford to the antenna frame a functionality desired by the user, the frame and the one or more modules being so arranged that the one or more modules can be simply mounted by the user himself.

2. An antenna frame according to claim 1, wherein the one or more modules can be mounted through a snap-fit system.

3. An antenna frame according to claim 1 or 2, wherein the antenna frame has a base section provided with cover plates, which contains between the cover plates a hollow space for receiving one or more electronics modules.

4. An antenna frame according to claim 3, wherein the hollow space contains connecting means for electronics modules.

5. An antenna frame according to any one of the preceding claims, wherein the one or more modules comprise a cover plate for wholly or partly covering the antenna frame.

6. An antenna frame according to claim 5, wherein the cover plates are at least partly arranged to be provided with text and/or images.

7. An antenna frame according to claim 5 or 6, wherein at least one cover plate has an electromagnetic shielding action.

8. An antenna frame according to any one of the preceding claims, wherein the antenna frame is provided with hollow parts, in which extends wiring for the purpose of the modules to be connected.

9. An antenna frame according to any one of the preceding claims, wherein the antenna frame comprises two uprights which are connected by a base section and by a top plate.

10. An antenna frame according to claim 9, wherein between the uprights a number of crossbars extend.

11. An antenna frame according to claim 10, wherein at least one of the crossbars is a hollow bar.

12. An antenna frame according to claim 11, wherein the hollow bar is provided with at least one opening and wiring extending in the bar, which wiring is connected with a first contact element in the opening, wherein a module can be placed on the crossbar, which module in mounted condition has a second contact element reaching into the opening of the bar, which makes contact with the first contact element.

13. An antenna frame according to claim 12, wherein the module placed on the crossbar is a customer counting module, which is provided with springing brackets embracing the crossbar.

14. An antenna frame according to claim 5, 6, or 7, wherein the cover plate, through attachment to the frame, has been brought into a bulged form.

15. An antenna frame according to claim 14, wherein the bulged form of the cover plate, or the cover plates, is supported by one or more crossbars, which extend between uprights, which, connected by a base section and a top plate, are part of the antenna frame, or by a module connected with one or more of the crossbars.

16. An antenna frame according to one or more of claims 5, 6, 7, 14, or 15, wherein the cover plate is provided with at least one rounded or beveled corner point.

17. An antenna frame according to any one of the preceding claims, wherein the one or more modules comprise a module for person identification and registration.

18. An antenna frame according to any one of the preceding claims, wherein the one or more modules comprise a module for data storage of detected labels.

19. An antenna frame according to claim 18, wherein the module for data storage of detected labels is combined with a goods storage system.

20. An antenna frame according to any one of claims 9-13, wherein the uprights in the longitudinal direction thereof have a profiled cross section.

21. A module for use in a modular multifunctional antenna frame according to any one of the preceding claims.

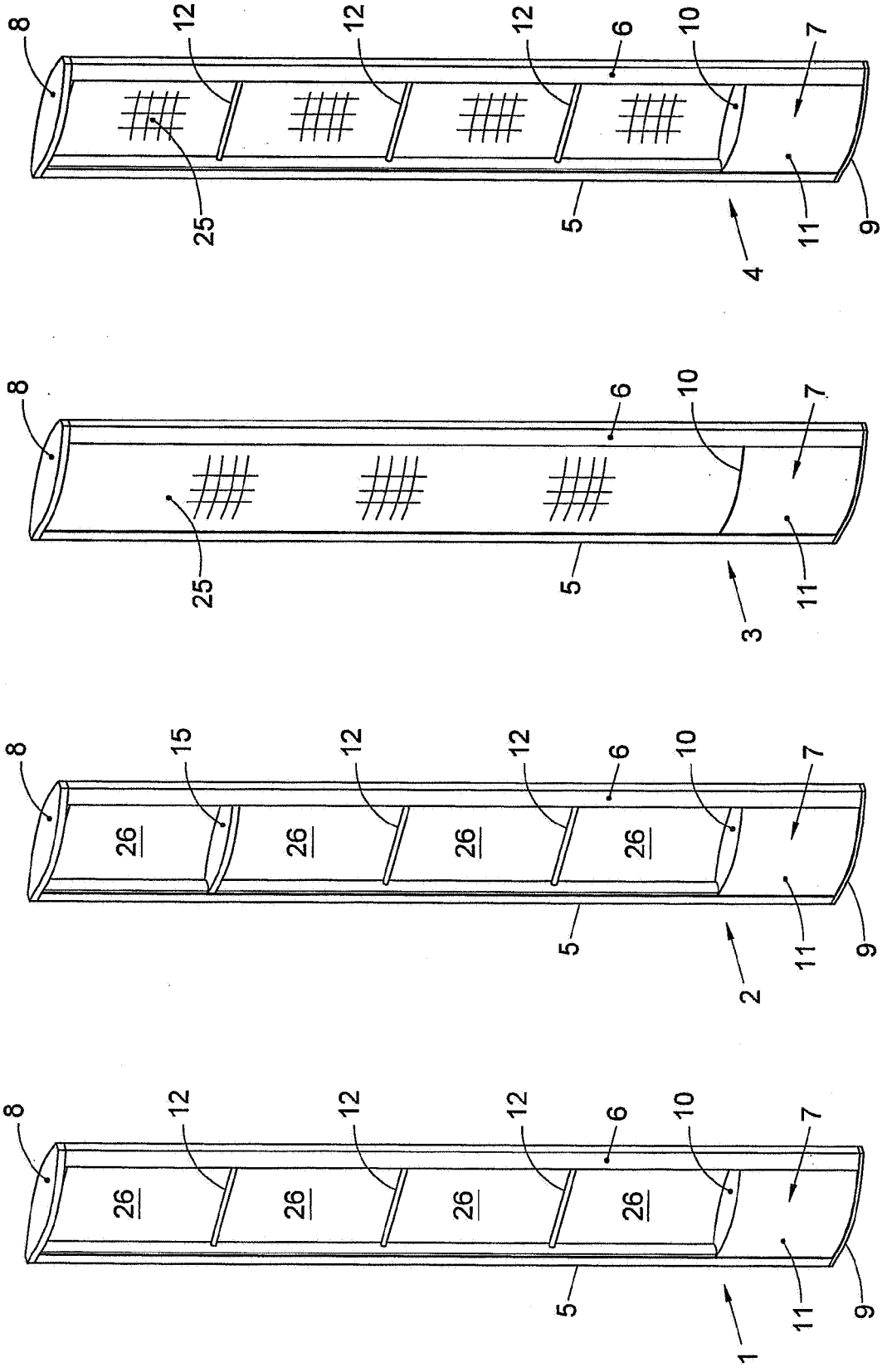
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Fig. 1

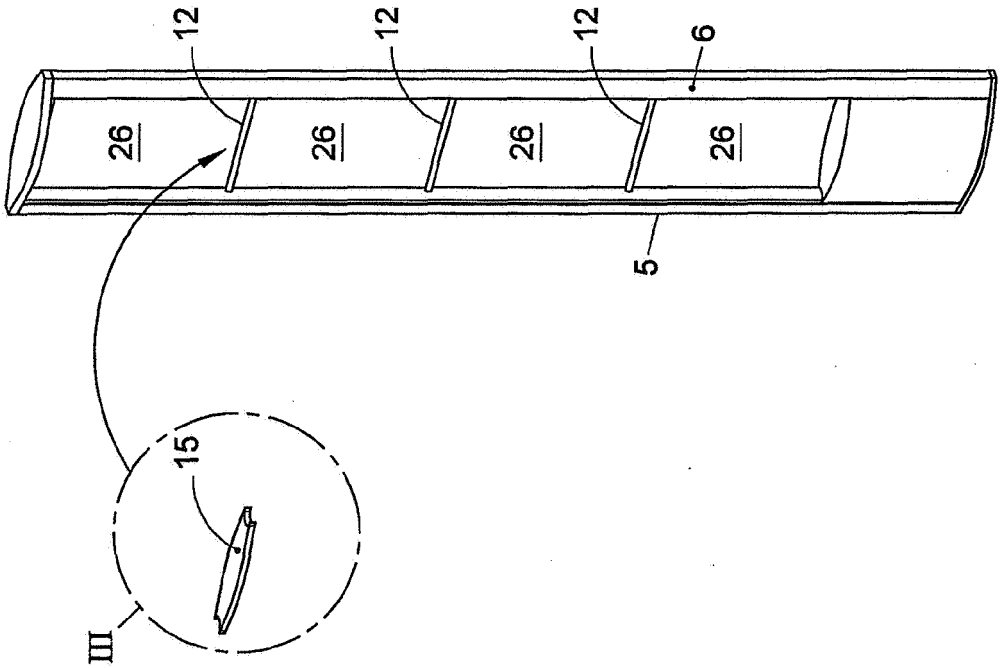

Fig. 2

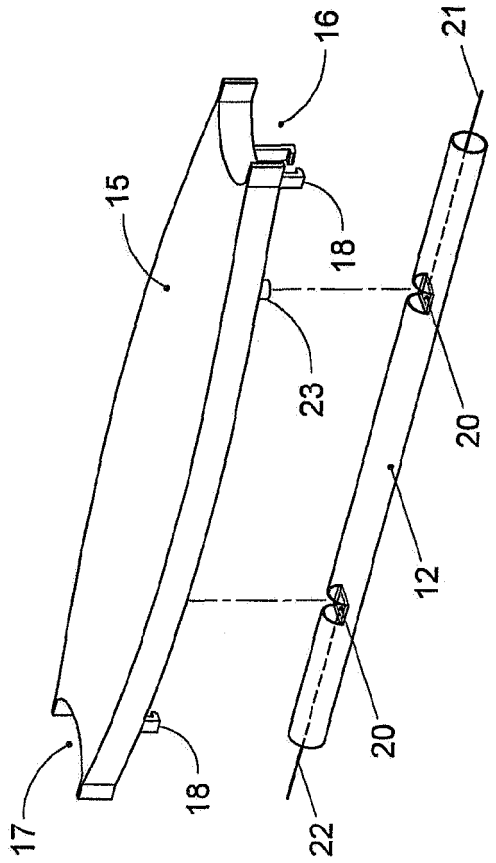

Fig. 3

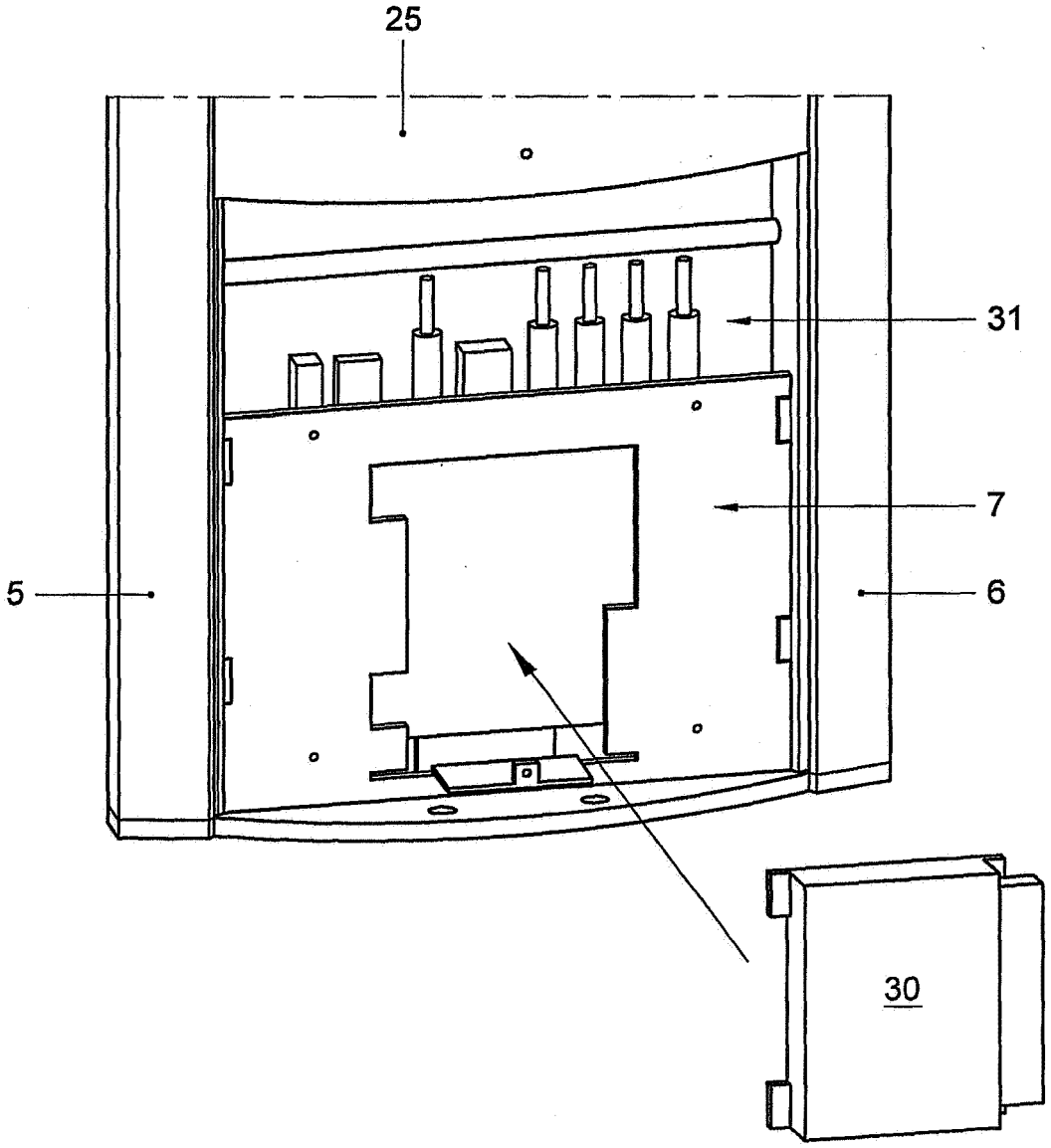

Fig. 4

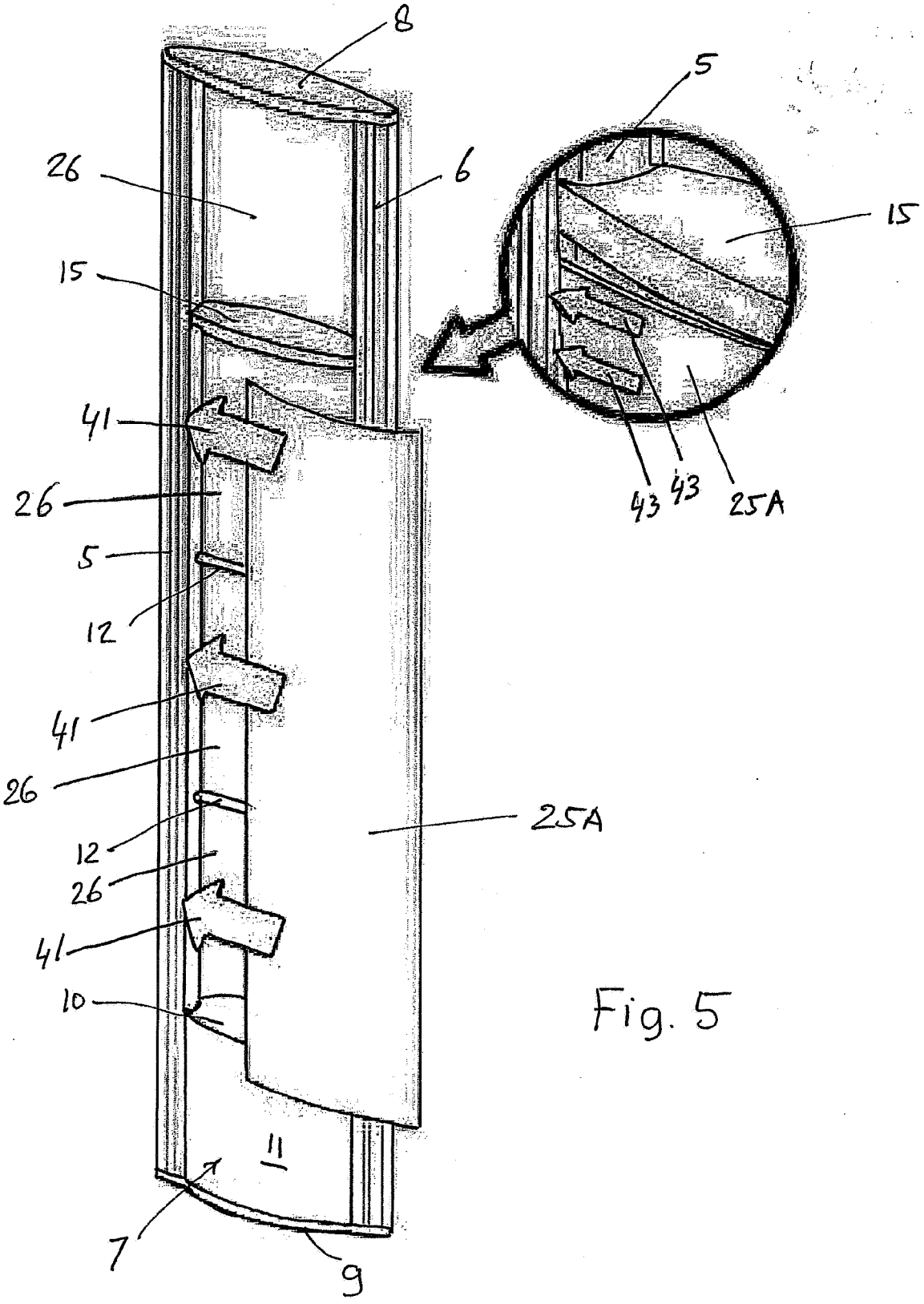

Fig. 5

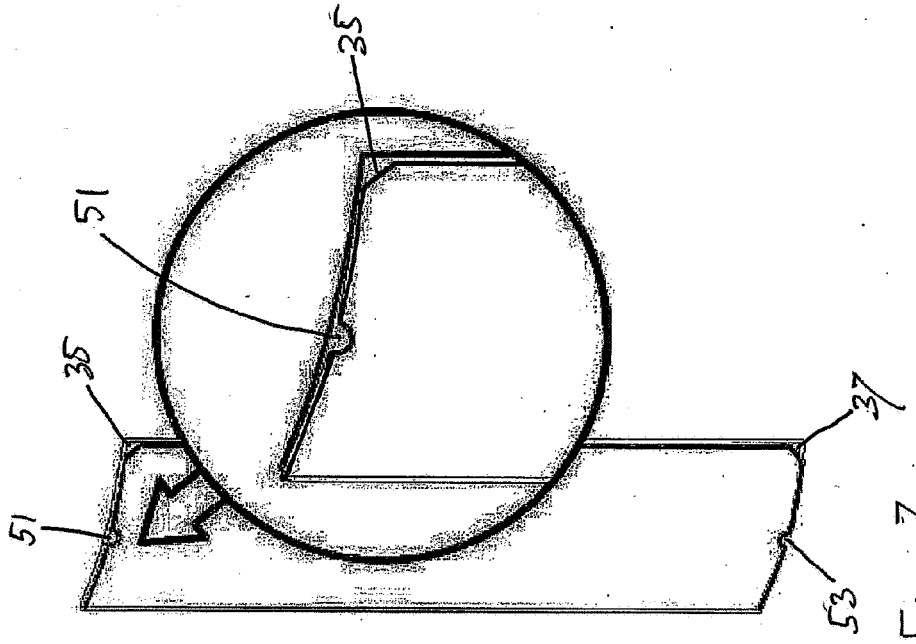

Fig. 7

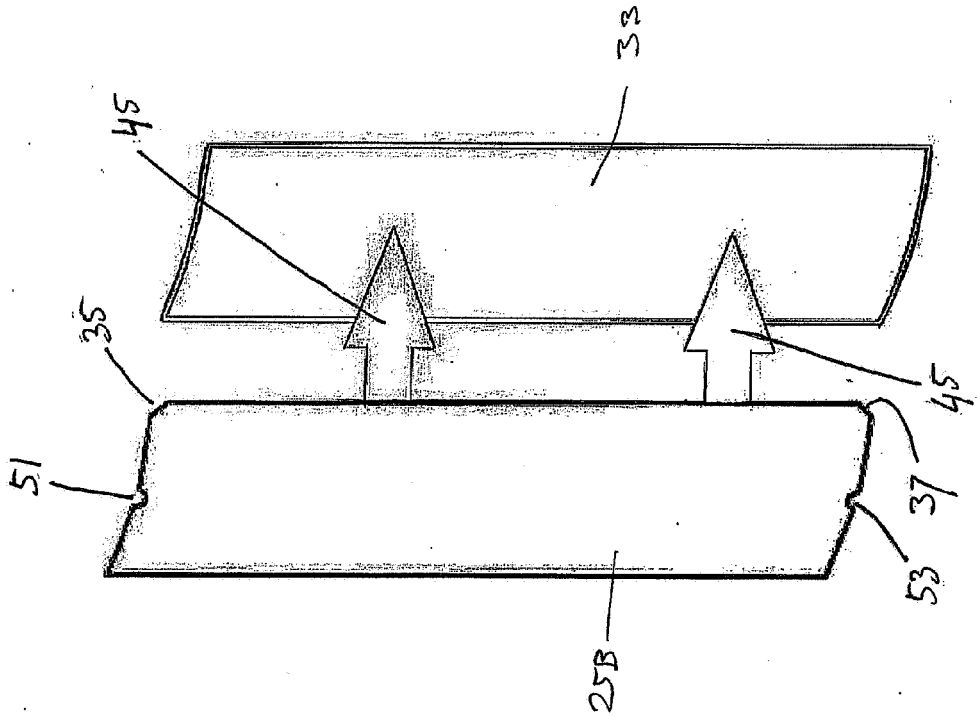

Fig. 6

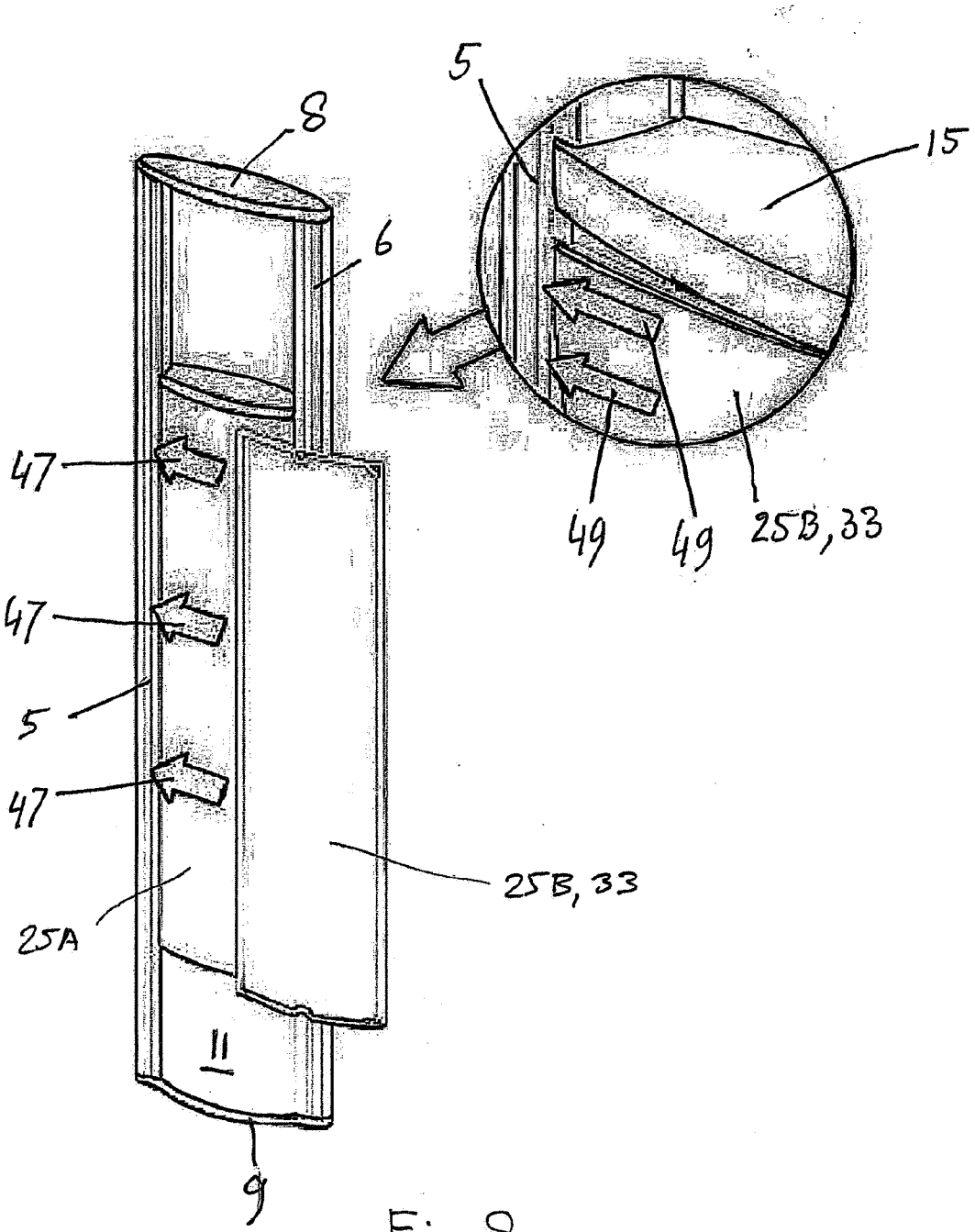

Fig. 8

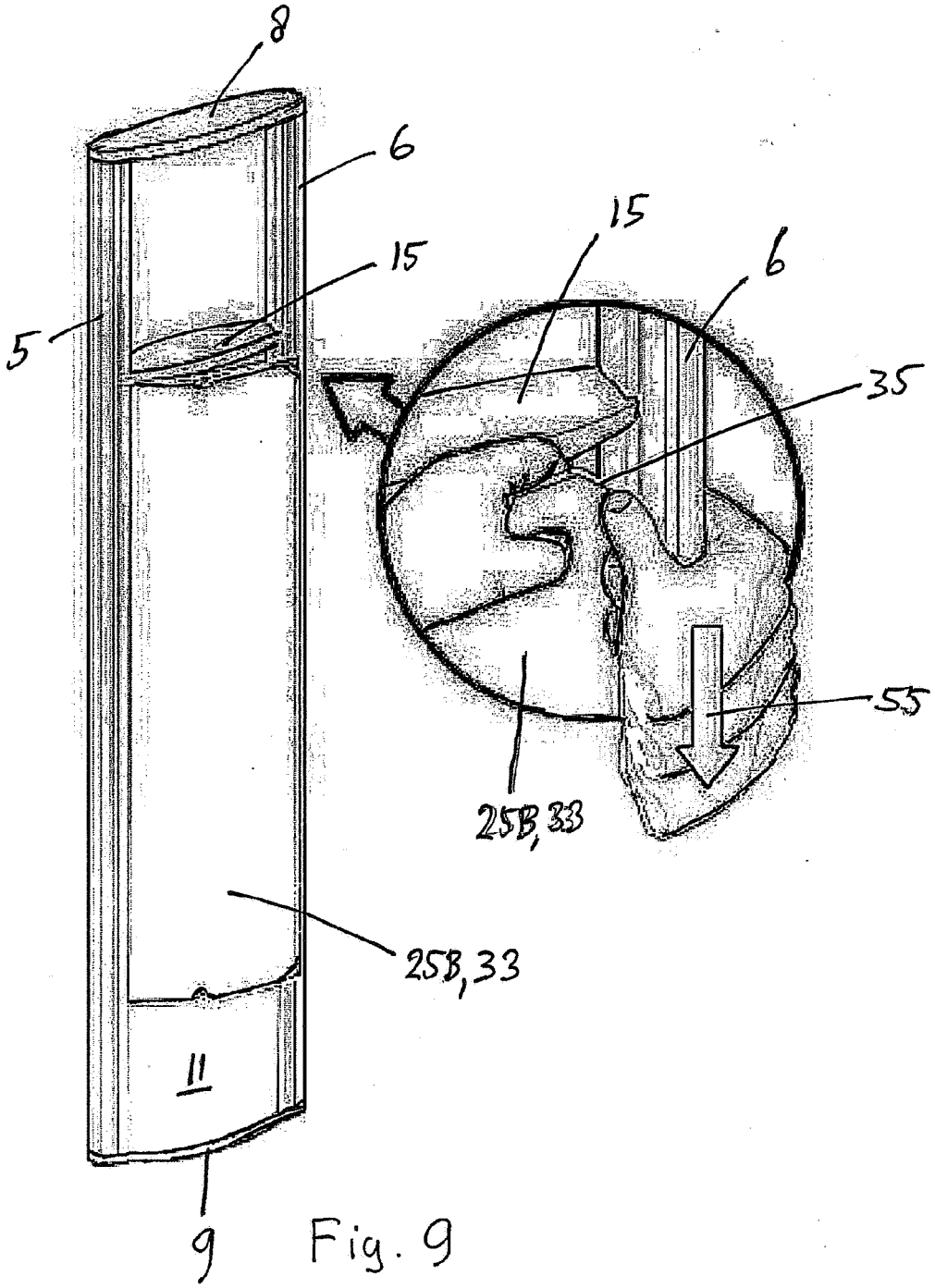

Fig. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 08 15 3799

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 Y	EP 0 703 637 A (ACTRON ENTWICKLUNGS AG [CH]) 27 March 1996 (1996-03-27) * the whole document * -----	1-11, 14-21 12,13	INV. H01Q1/22 H01Q1/44 H01Q7/00
Y A	EP 0 668 626 A (SENSORMATIC ELECTRONICS CORP [US]) 23 August 1995 (1995-08-23) * the whole document * -----	12,13 1-11, 14-21	G08B13/24
A	FR 2 809 279 A1 (PRAT LIONEL [FR]) 23 November 2001 (2001-11-23) * the whole document * -----	1-21	

TECHNICAL FIELDS SEARCHED (IPC)
H01Q G08B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	30 May 2008	Moumen, Abderrahim

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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30-05-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0703637 A	27-03-1996	JP 8321717 A	03-12-1996
EP 0668626 A	23-08-1995	BR 9500478 A	24-10-1995
		CA 2136390 A1	19-08-1995
		JP 7249914 A	26-09-1995
FR 2809279 A1	23-11-2001	NONE	

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