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(71) Applicant: **Bakker Holding Son B.V.**
5692 EL Son (NL)

(72) Inventor: **BERGMANS, Hans**
5553 CR Valkenswaard (NL)

(74) Representative: **Cohausz & Florack**
Patent- & Rechtsanwälte
Partnerschaftsgesellschaft mbB
Bleichstraße 14
40211 Düsseldorf (DE)

(54) **PANEL, KIT OF PARTS, SYSTEM AND METHOD FOR PRODUCING A PANEL**

(57) The invention relates to a panel (54a-g), in particular wall panel, for attaching thereto a sheet (59, 60) for presentation purposes, the panel preferably being produced with a method according to one of claims 13 to 15, the panel (54a-g) having a back side to be placed against a mounting construction (58) and a front side for attaching thereto a sheet (59, 60), wherein the panel (54a-g) comprises a layer of magnetic or magnetizable foil arranged such that when a sheet (59, 60) with a layer comprising magnetizable or, respectively, magnetic material is attached to the front side (6), the sheet (59, 60) is held in place by means of magnetic force, and wherein on the front side (6), the panel (54a-g) is coated with a fire-resisting coating layer. The invention further relates to a kit of parts for assembling a magnetic or magnetizable board (56) for attaching thereto a sheet (59, 60) for presentation purposes, Systems for mounting a panel (54a-g) and a method for producing a panel (54a-g).

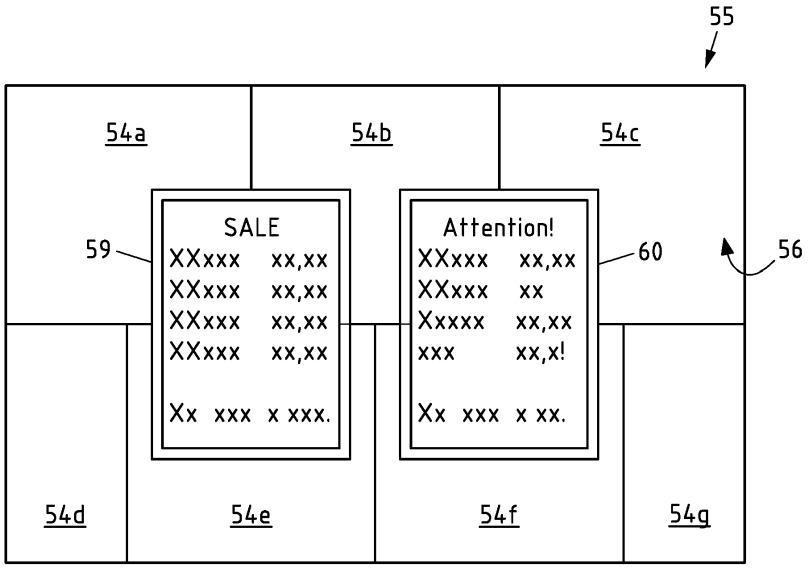

Fig.3b

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Description

[0001] The invention relates to a panel, in particular a wall panel, for attaching thereto a sheet for presentation purposes, the panel having a back side to be placed against a mounting construction and a front side for attaching thereto a sheet. The invention further relates to a kit of parts for assembling a board comprising a plurality of such panels. The invention further relates to systems for mounting such a panel or board to a mounting construction. The invention further relates to a method for producing such panels.

[0002] Shops like grocery stores usually have dedicated wall areas near the entrance for attaching thereto posters and billboards announcing special offers, news or events related to the store.

[0003] In shops, the posters and billboards are often attached to the wall by adhesive tape or pushpins, for example to pin boards provided near the entrance. However, it is often difficult to attach the poster to the wall without wrinkles or at a horizontal level, in particular if the poster has oversize. Also, the attachment with adhesive tape or pushpins is sometimes optically unappealing.

[0004] There are also shops with dedicated poster frames into which posters may be inserted behind a transparent front window made of glass or a plastic film. These frames are dedicated to particular poster sizes so that posters with different sizes do not fit. It can also be quite fiddly to insert the poster into the frames and therefore consume quite a lot of time.

[0005] The problem of attaching a sheet to a mounting construction also arises in other surroundings, for example when assembling a modular booth wall. Such modular booth walls usually comprise a collapsible frame construction and one or several printed sheets that have to be attached to the frame construction to form the front of the booth wall. Systems known in the art for attaching the printed sheets to the frame construction are often cumbersome to handle and make it difficult to attach the sheets without wrinkles. Further, more than one person is usually needed for assembling such booth walls known in the art.

[0006] Panels, in particular wall panels, or wall constructions such as booth walls also have to comply with certain safety regulations, in particular fire protection regulations. Such fire protection regulations are particularly relevant if the wall panel or wall construction is to be mounted in spaces open to the public such as in grocery stores or fair trade halls.

[0007] In view of this, the present invention faces the technical problem of providing a secure system for mounting sheets to a mounting construction in an easy and optically appealing manner.

[0008] This problem is at least in part solved according to the invention by means of a panel, in particular a wall panel, for attaching thereto a sheet for presentation purposes, the panel having a back side to be placed against a mounting construction and a front side for attaching thereto a sheet, wherein the panel comprises a layer of magnetic or magnetizable foil arranged such that when a sheet with a layer comprising magnetizable or, respectively, magnetic material is attached to the front side, the sheet is held in place by means of magnetic force, and wherein on the front side the panel is coated with a fire-resisting coating layer.

[0009] In this way, a panel is made available that may be mounted to a mounting construction to provide for a magnetic or magnetizable area. Such a magnetic or magnetizable area allows attaching thereto a sheet such as a poster or billboard with a layer comprising magnetizable or, respectively, magnetic material in a very easy and optically appealing manner. In particular, multiple panels of the same kind may be assembled and mounted to a mounting construction to form a large magnetic or magnetizable area of a desired size, so that for example oversize posters may easily be attached to and detached from the magnetic or magnetizable area.

[0010] The fire-resisting coating layer ensures that the wall panel can fulfill safety regulations that are mandatory for arranging the panel in particular places such as the entrance area of a grocery store. In particular, a panel may be provided that is classified as B1 according to DIN 4102. A product being classified as B1 according to DIN 4102 is understood to mean that the product fulfils the requirements of both B1 tests as defined in DIN 4102-1 and 4102-16. In other words, a product classified as B1 has passed the so-called small fire test according to DIN 4102-1 and the so-called large fire test according to DIN 4102-16.

[0011] Conventional panels being classified as B1 are generally known in the art. However, it was found that applying a magnetic or magnetizable foil to a panel structure usually results in that the resulting product fails the B1-tests defined in DIN 4102-1 and 4102-16 and therefore would be an unsafe product that must not be mounted in certain places for security reasons. So that it would be very difficult to fulfill the B1 tests with a product comprising a magnetic or magnetizable foil on an outer side, even if the rest of the product as such would fulfill the B1 tests.

[0012] It was discovered within the context of the present invention that, unexpectedly, a fire-resisting coating applied on the front side of the panel is sufficient to improve the fire resistance of the panel in such a way that the magnetic or magnetizable foil is sufficiently protected against flames and that the whole product can therefore meet mandatory fire safety regulations. In particular, a panel can be provided that is classified as B1 according to DIN 4102.

[0013] Preferably, the panel structure without the magnetic or magnetizable foil and the fire-resisting coating layer is already classified as B1 according to DIN 4102. If for example the panel comprises a base plate covered with the magnetic or magnetizable foil, the base plate as such is preferably classified as B1. The base plate may for example be an

aluminum composite panel such as a sandwich structure comprising an inner plastics, in particular polyethylene, layer and two outer aluminum layers. Such a structure is also known as aluminum dibond.

[0014] The panel comprises a layer of magnetic or magnetizable foil. Magnetic foil is a foil of rubber and/or plastic comprising permanent magnetic particles such as ferrite particles. Magnetizable foil is a foil of rubber and/or plastic comprising magnetizable particles such as iron powder, so that permanent magnets may be attached to it. If a magnetic foil is used, the magnetic foil is arranged such that when a sheet with a layer comprising magnetizable material is attached to the front side, the sheet is held in place by means of magnetic force. Accordingly, if a magnetizable foil is used, the magnetizable foil is arranged such that when a sheet with a layer comprising magnetic material is attached to the front side, the sheet is held in place by means of magnetic force. For that purpose, the magnetic or magnetizable foil is preferably arranged on the front side of the panel. In particular, the panel may comprise a base plate, the front side of which being covered by the magnetic foil or the magnetizable foil.

[0015] The magnetic foil provides a permanent magnetic area so that sheets with a layer comprising magnetizable material (e.g. iron powder) that are attached to the panel are held in place by means of magnetic force. Likewise, the magnetizable foil provides a magnetizable area to which permanent magnets may be attached to so that sheets with a layer comprising magnetic material (e.g. ferrite powder) that are attached to the panel are held in place by means of magnetic force. Since the magnetic or magnetizable foil provides a two dimensional magnetic area, the sheets may be attached to the panel very easily and without any wrinkles.

[0016] Sheets with a layer comprising magnetizable or magnetic material that may be attached to the panel are for example printed posters or billboards which are coated with a layer containing magnetizable material such as iron powder or magnetic material such as ferrite powder.

[0017] The problem named above is further at least in part solved according to the invention by means of a kit of parts for assembling a magnetic or magnetizable board for attaching thereto a sheet for presentation purposes, the kit of parts comprising a plurality of panels as described above, wherein the panels are configured to form a board with a continuous magnetic or, respectively, magnetizable area when arranged next to each other in a predefined arrangement.

[0018] The kit of parts allows assembling a large board from a plurality of panels, whereby the board then provides a large continuous magnetic or magnetizable area, respectively. To this end, the dimensions of the panels of the kit of parts are adapted to each other in such a way that the panels may be arranged next to each other in a stepless and gapless way. For example, the panels may have uniform thickness and rectangular shape.

[0019] In this way, the kit of parts allows forming a magnetic or magnetizable area that is larger than the area of the individual panels. For example, the magnetic or magnetizable area provided by the panels when assembled may have a width and height of several meters each.

[0020] Preferably, the number, shape and dimensions of the panels of the kit of parts are selected such that the panels, if arranged next to each other in a predefined arrangement, form a board with a rectangular outer shape of predefined size. The individual panels may be provided with markings indicating the individual position of each panel in the predefined arrangement.

[0021] The problem named above is further at least in part solved according to the invention by means of a method for producing a panel as described above, comprising the following steps: providing a base plate, covering a front side of the base plate with a layer of magnetic or magnetizable foil, and applying a liquid lacquer onto the side of the base plate being covered with the magnetic or magnetizable foil to form a fire-resisting coating layer.

[0022] The base plate is preferably classified as B1 according to DIN 4102. In particular, the base plate may be an aluminum composite panel such as an aluminum dibond. A front side of the base plate is covered with a layer of magnetic or magnetizable foil. For example, the magnetic or magnetizable foil may be glued to the base plate.

[0023] A liquid lacquer is applied onto the side of the base plate being covered with the magnetic or magnetizable foil. The liquid lacquer may for example be applied by curtain coating. Preferably, the liquid lacquer is however applied by roller coating since this ensures a uniform thickness of the coating layer and thus uniform fire protection of the panel. The applied layer of liquid lacquer is then dried and/or cured, preferably UV dried and/or cured. The lacquer is preferably applied in such an amount that the coating layer has a thickness of at least 10 μm, more preferably at least 15 μm after drying and/or curing. Very uniform coating layers have been achieved by using a three roller system for roller coating in which two small rollers divide the liquid lacquer and apply it onto a larger roller which then applies it to the panel.

[0024] The liquid lacquer is applied to form a fire-resisting coating layer. The fire-resisting coating layer covers the magnetic or magnetizable foil and therewith protects the magnetic or magnetizable foil from fire. It was found that such a fire-resisting coating layer is sufficient to increase the safety of the resulting panel significantly. In particular, a panel can be produced that fulfills the B1-tests according to DIN 4102-1 and 4102-16, i.e. a panel that is classified as B1.

[0025] Several embodiments of the panel, of the kit of parts and of the method will be described in the following, wherein the individual embodiments likewise relate to the panel, to the kit-of-parts as well as to the method. The individual embodiments may also be combined with each other in any combination.

[0026] According to an embodiment, the panel comprises a base plate which is covered with the magnetic or magnetizable foil. The base plate is preferably non-magnetic and preferably also non-magnetizable. The base plate as such

is preferably classified as B1 according to DIN 4102. The base plate is useful to provide the panel with the desired mechanical characteristics, in particular with respect to stiffness and stability. Preferably, the base plate has a sandwich structure with two metal layers, in particular aluminum layers, which metal layers are spaced apart from each other by a plastic layer arranged in between. In particular, the base plate may be an aluminum composite panel such as an aluminum dibond, which provides both low weight and high stiffness.

[0027] According to an embodiment, the fire-resisting coating layer forms the outermost layer on the front side of the panel. In this way the fire-resisting coating layer is able to protect all possible layers below the fire-resisting coating layer, in particular including the magnetic or magnetizable foil, but also possible further layers of the panel.

[0028] According to an embodiment, the fire-resisting coating layer is a thermosetting polymer based layer comprising at least 10 wt.%, preferably at least 12 wt.%, in particular at least 15 wt.% of flame retardant fillers. It was found that sufficient flame resistance may be achieved with these proportions of flame retardant fillers. Preferably, the polymer-based layer contains at most 25 wt.%, preferably at most 20 wt.% flame retardant fillers. Examples for flame retardant fillers are aluminum hydroxide or halogenated alkyl phosphates or phosphonates.

[0029] According to an embodiment, the fire-resisting coating layer is produced from a UV curing epoxy acrylate based lacquer, preferably having the following composition in wt.%:

epoxy acrylates:	30 wt.% - 50 wt.%,
flame retardant fillers:	10 wt.% - 20 wt.%,
defoamer and wetting agent:	0 wt.% - 3 wt.%, in particular 1- 3 wt.%,
matting agent:	0 wt.% - 7 wt.%, in particular 3 - 7 wt.%,
photoinitiator:	0 wt.% - 6 wt.%, in particular 2 - 6 wt.%,
other constituents:	0 wt.% - 5 wt.%,
reactive solvent:	remainder, in particular at least 30 wt.%.

[0030] According to a corresponding embodiment of the method, the liquid lacquer is a UV curing epoxy acrylate based lacquer comprising at least 10 - 30 wt.-% of flame retardant fillers.

[0031] Preferably, the liquid lacquer has the following composition in wt.%:

epoxy acrylates:	30 wt.% - 50 wt.%,
flame retardant fillers:	10 wt.% - 20 wt.%,
defoamer and wetting agent:	0 wt.% - 3 wt.%, in particular 1- 3 wt.%,
matting agent:	0 wt.% - 7 wt.%, in particular 3 - 7 wt.%,
photoinitiator:	0 wt.% - 6 wt.%, in particular 2 - 6 wt.%,
other constituents:	0 wt.% - 5 wt.%,
reactive solvent:	remainder, in particular at least 30 wt.%.

[0032] The UV curing epoxy acrylate based lacquer is preferably applied onto the front side of the panel, in particular directly onto the magnetic or magnetizable foil, and then cured.

[0033] The compositions named above were found to be particularly suitable to protect the magnetic or magnetizable foil against flames and to achieve a panel which is classified as B1 according to DIN 4102.

[0034] According to an embodiment, the fire-resisting coating layer has a thickness of at least 10 μm, preferable at least 15 μm. When the thickness of the coating layer is lower, the fire resistance may not be sufficient for the B1 tests.

[0035] According to an embodiment, the fire-resisting coating layer has a uniform thickness. Preferably, a portion of the coating layer of at least 90 % of the panel size has a variation in thickness of less than 5 μm. This is understood to mean that the thickness varies less than 5 μm on an area of at least 90 % of the panel size. Such a uniform thickness of the coating layer results in very uniform fire resistance without weak spots. The uniform coating can be achieved for example by roller coating, in particular by using a three-roller system.

[0036] According to an embodiment, the panel comprises lateral side connection means, in particular of a tongue-and-groove and/or magnetic type, configured to connect the panel to one or more other panels of the same kind. By means of the side connection means, multiple panels may be connected with each other at their lateral sides so that the panels are fixed in a stable position to each other. The lateral side connection means also provide structural stability for the magnetic or magnetizable area assembled from the panels.

[0037] The lateral side connection means may be of a tongue-and-groove type. For example, the panel may comprise grooves in its side edges configured to receive a connection element such as a connection disk, a connection plate or a connection rod. For connecting two panels of the same kind, the panels can be arranged next to each other such that

a connection element may be inserted into two grooves of the two panels facing each other.

[0038] The panel may also comprise magnetic lateral side connection means, so that multiple panels may be connected to each other at their side edges by magnetic force. For example, the side edges of the panel may be equipped with permanent magnets arranged such that the magnets attract magnets of a neighboring panel when arranged next to each other. Magnetic lateral side connection means allow the panels being connected to and disconnected from each other very easily.

[0039] According to a corresponding embodiment of the kit of parts, the panels of the kit of parts comprise lateral side connection means configured to mutually connect the individual panels to form the magnetic or magnetizable area. Preferably, the side connection means are magnetic so that the individual panels may be connected by magnetic force.

[0040] According to an embodiment, the panel comprises mounting means configured to mount the back side of the panel to a mounting construction. The mounting construction may be a stationary wall of a building or a mobile mounting construction such as a booth wall frame.

[0041] The mounting means may be mechanical means such as clamps, screws or the like. In a preferred embodiment, the mounting means may be magnetic, so that the panel may be mounted to a mounting construction by means of magnetic force. For example, the back side of the panel may be equipped with permanent magnets which may cooperate with according permanent magnets provided on the mounting construction. Magnetic mounting means allow mounting and unmounting the panels very easily.

[0042] According to a further embodiment of the panel, the base plate has a sandwich structure with two metal layers spaced apart from each other by a plastic layer arranged in between, wherein the base plate provides a reception between the two metal layers for inserting a mounting element from a side edge of the base plate. In particular, the plastic layer may feature a gap or indentation for inserting a mounting element from the side edge. Also, the metal sheets may project over the plastic layer at a side edge so that a channel is provided along said side edge into which a mounting element may be inserted.

[0043] In this way, mounting means may be attached to the panel in an optically appealing manner. In particular, it is not necessary to use mechanical means such as screws or rivets for attaching the mounting means to the panel. Also, by inserting the mounting element between the two metal layers, the mounting element may be securely attached to the plate without significantly increasing the structural height of the plate.

[0044] Accordingly, the panel or the kit of parts preferably comprises as mounting means a corresponding mounting element being insertable into the reception provided between the two metal layers of the base plate of the panel from a side edge of the base plate.

[0045] The mounting element may be hook-shaped with a first end for being inserted into the reception between the two metal layers and with a second end extending on the back side of the panel. In this way, the mounting element is only visible on the side edge of the panel and a major part of the mounting element and/or other elements interacting with the mounting element can be hidden behind the panel.

[0046] For example, the hook-shaped mounting element may be hooked into a corresponding second mounting element attached to a mounting construction, wherein the second mounting element is hidden behind the panel and therefore invisible to the beholder of the panel.

[0047] The mounting element and the base plate may be permanently fixed to each other, for example by gluing, or they may form separate components. For example, the mounting element may be a separate element configured for being attached to a mounting construction such as a wall, for example by screws. The base plate may then be attached to the mounting element by inserting part of the mounting element into the reception between the two metal layers.

[0048] Accordingly, the problem named in the outset is also at least in part solved according to the invention by means of a system for mounting a panel as described above or a board assembled from a kit of parts as described above to a mounting construction, the system comprising a panel as described above or a kit of parts as described above with such a panel, wherein the panel has a base plate with a sandwich structure having two metal layers spaced apart from each other by a plastic layer arranged in between, and the system further comprising a mounting element configured for being mounted to a mounting construction, the mounting element further being partially insertable into a corresponding reception provided between the two metal layers of the base plate of the panel from a side edge of the panel. In this way, a system is provided that allows mounting of a panel or board in a very discreet manner. In particular, the mounting element is connected to the panel from the side so that no holes have to be drilled through the front side providing the magnetic or magnetizable area.

[0049] Furthermore, the problem named above is also at least in part solved according to the invention by means of a system for mounting a panel as described above or a board assembled from a kit of parts as described above to a mounting construction, the system comprising a panel as described above or a kit of parts as described above with such a panel, and the system further comprising a mounting element, the mounting element comprising a first part configured for being partially inserted into a face end reception of a holding profile and comprising a second part with a lateral reception for receiving therein a side edge of the panel or of the board. Preferably, the mounting element may constitute a frame, into which the panel or the board may be inserted.

[0050] There are existing holding profiles attached to mounting constructions such as walls that are conventionally used for attaching thereto canvas or other presentation sheets. These holding profiles comprise face end receptions for attaching thereto the canvas or sheet, i.e. receptions with an opening pointing away from the mounting construction. Such holding profiles are usually unsuitable for mounting a panel or board as described above. It was however found, that such available holding profiles may be used for mounting a panel or board by making use of the system as described above. The mounting element of the system allows connecting a panel or board to the holding profile by acting as a intermediate piece. The mounting element with its second end is inserted into the reception of the holding profile and then with the lateral reception provides a reception that has an opening basically in parallel to the mounting construction, so that it is possible to insert a board or panel into that reception.

[0051] According to an embodiment of the kit of parts, the kit of parts comprises a mobile mounting construction, wherein at least one of the panels of the kit of parts comprises mounting means configured to mount the board that can be assembled from the panels to the mobile mounting construction. Preferably, multiple panels of the kit of parts comprise according mounting means. In this way, a kit of parts for assembling a mobile magnetic or magnetizable area can be provided, i.e. a magnetic or magnetizable area that may be positioned as desired even if a fixed mounting construction like a building wall is not available at that position for mounting thereto the magnetic or magnetizable board assembled from the panels of the kit of parts. In this embodiment, the mobile mounting construction serves as mounting construction for mounting thereto the magnetic or magnetizable board that can be assembled from the panels.

[0052] The mobile mounting construction may in particular be a collapsible booth frame structure for a booth wall. In this way, a kit of parts for assembling a mobile booth wall is provided.

[0053] It was found that a magnetic or magnetizable area is particularly preferable for booth walls since booth walls usually have to be covered with a large sheet which is printed with logos or a corporate color of a company. Such sheets can easily be attached to the mobile magnetic or magnetizable area that is provided by the embodiment of the kit of parts described above with little effort and without any wrinkles. A booth wall provided by the kit of parts also allows exchanging the sheet in a very quick manner so that the booth wall can easily be used for different trade fairs or different companies.

[0054] According to a preferred embodiment, the kit of parts further comprises a sheet with a layer comprising magnetizable or magnetic material, which sheet is configured to be attached to the magnetic or, respectively, magnetizable area of the magnetic board that can be assembled from the panels. If the panels comprise a magnetizable foil, the sheet has a layer with magnetic material. If the panels comprise a magnetic foil, the sheet may have a layer of magnetized material or of magnetic material. The sheet is preferably printed.

[0055] Further advantages and features of the present invention become apparent from the following description of several exemplary embodiments of the panel, of the kit of parts, of the method and of the systems, wherein reference is made to the drawings.

[0056] In the drawings

Fig. 1a-b show an exemplary embodiment of the panel according to the invention,

Fig. 2 shows exemplary embodiments of the panel and of the kit of parts according to the invention,

Fig. 3a-b show further exemplary embodiments of the panel and of the kit of parts according to the invention,

Fig. 4a-b show further exemplary embodiments of the panel and of the kit of parts according to the invention,

Fig. 5 shows an exemplary embodiment of a system for mounting a panel or a board assembled from a kit of parts to a mounting structure,

Fig. 6 shows a further exemplary embodiment of a system for mounting a panel or a board assembled from a kit of parts to a mounting structure,

Fig. 7 shows an exemplary embodiment of another system for mounting a panel or a board assembled from a kit of parts to a mounting structure, and

Fig. 8 shows an exemplary embodiment of the method for producing a panel.

[0057] Figures 1a-b show an exemplary embodiment of the panel according to the invention. Fig. 1a shows a top view and Fig. 1b shows a sectional view corresponding to the sectional plane indicated in Fig. 1a as "Ib".

[0058] Panel 2 has a back side 4 to be placed against a mounting construction and a front side 6 for attaching thereto a sheet such as a poster or billboard sheet. Panel 2 may be a wall panel, for example.

[0059] Panel 2 comprises a base plate 8 which in the present example is an aluminum composite plate with a sandwich structure having two aluminum layers 10, 12 spaced apart from each other by a polyethylene layer 14 arranged in between. This structure is also known as aluminum dibond. Base plate 8 as such fulfills the B1-tests of DIN 4102-1 and DIN 4102-16 and is therefore classified as B1 according to DIN 4102.

[0060] A magnetic foil 16, for example a rubber foil containing ferrite powder, is glued to the front side of base plate 8, so that the front side 6 of panel 2 is magnetic. The magnetic foil 16 is coated with a fire-resisting coating layer 18 which has been produced by applying a UV curing epoxy acrylate based liquid lacquer to the magnetic foil 16 and curing the lacquer by UV light.

[0061] The liquid lacquer used to produce the fire-resisting coating layer 18 has the following composition in wt.%:

epoxy acrylates:	30 wt.% - 50 wt.%,
flame retardant fillers:	10 wt.% - 20 wt.%,
defoamer and wetting agent:	0 wt.% - 3 wt.%, in particular 1- 3 wt.%,
matting agent:	0 wt.% - 7 wt.%, in particular 3 - 7 wt.%,
photo initiator:	0 wt.% - 6 wt.%, in particular 2 - 6 wt.%,
other constituents:	0 wt.% - 5 wt.%,
reactive solvent:	remainder, in particular at least 30 wt.%.

[0062] It was found that the fire-resisting coating layer 18 is suitable to protect the magnetic foil 16 from flames so that the panel 2 including the base plate 8, the magnetic foil 16 and the fire-resisting coating layer 18 fulfills the B1-tests defined in DIN 4102-1 and 4102-16 and is therefore classified as B1.

[0063] In one particular example, a liquid lacquer with the following composition in wt.% has been used for producing the fire-resisting coating layer 18:

epoxy acrylates:	40,0 wt.%,
flame retardant fillers:	15,0 wt.%,
defoamer and wetting agent:	1,6 wt.%,
matting agent:	5,5 wt.%,
photo initiator:	4,0 wt.%,
reactive solvent:	33,9 wt.%.

[0064] Good results were achieved in the B1 tests with the panels having a fire-resisting coating layer 18 produced from this liquid lacquer composition.

[0065] Panel 2 is further equipped with lateral side connection means 20 in the form of several grooves 22 arranged at the four lateral sides of panel 2. For connecting two panels 2, 2', the panels 2 are arranged next to each other such that two grooves 22, 22' of the two panels 2, 2' face each other and a connection element 24 is inserted into the two facing grooves 22, 22'. The connection means 20 are therefore understood to be of a tongue-and-groove type.

[0066] Panel 2 further comprises bore holes 26 as connection means 28 so that the panel 2 may be screwed to a mounting construction 31 such as a building wall by guiding screws 30 through the bore holes 26 and screwing the screws 30 to the mounting construction 31 on the back side 4 of panel 2.

[0067] Instead of magnetic foil 16, also a magnetizable foil such as a rubber foil containing iron powder may be used for panel 2. Panel 2 then provides a magnetizable area to which sheet comprising magnetic material may be attached.

[0068] Figure 2 shows a sectional view of further exemplary embodiments of the panel and of the kit of parts according to the invention. Panels 32, 32' each have a similar structure as panel 2 shown in Figures 1a-b. Corresponding parts are therefore marked with the same reference numerals. Panels 32, 32' differ from panel 2 in that permanent magnets 36 are provided on the back side 4 of panels 32, 32' as connection means 34.

[0069] Figure 2 shows the two panels 32, 32' in an assembled state, in which the two panels 32, 32' are arranged next to each other and a connection element 24 is positioned in two grooves 22, 22' of the two panels 32, 32' facing each other. The two assembled panels 32, 32' thus form a magnetic board 37 with a continuous magnetic area 40.

[0070] The two panels 32, 32' and the connection element 24 form part of a kit of parts 38 for assembling a magnetic board 37. The magnetic board 37 provides for a continuous magnetic area with a size larger than the individual panels.

[0071] Instead of magnetic foil 16, panels 32, 32' may also comprise a magnetizable foil in each case. The two assembled panels 32, 32' then accordingly form a magnetizable board with a continuous magnetizable area.

[0072] Fig. 2 further shows a mounting construction 42 in the form of a building wall. The mounting construction 42 is provided with permanent magnets 44 corresponding to the permanent magnets 36 of the panels 32, 32'. Panels 32, 32' or the magnetic board 37 assembled from these panels, respectively, may be attached to the mounting construction 42

by arranging the panels 32, 32' such that the permanent magnets 36 are held in place by permanent magnets 44. These connection means 34 thus allow attaching and detaching the panels 32, 32' to and from a wall or other mounting construction in a very comfortable manner.

[0073] Figures 3a-b show further exemplary embodiments of the panel and of the kit of parts for assembling a magnetic or, respectively, a magnetizable board according to the invention. Fig. 3a shows a top view and Fig. 3b a front view of the kit-of-parts in an assembled state.

[0074] The kit of parts 52 comprises a number of panels 54a-g, the shapes and dimensions of which are adapted such that the panels 54a-g, if arranged next to each other in a predefined arrangement as shown in Fig. 3b, form a board 55 with a magnetic or magnetizable area 56 of predefined shape and dimensions, in this example of a rectangular shape.

[0075] The panels 54a-g may for example have a structure like panels 2 or 32 as described above. Some or all of the panels 54a-g comprise mounting means (not shown), which may for example be designed as mounting means 20 or 34 shown in Figs. 1a-b and 2, so that the panels 54a-g or the board 55 assembled therefrom can be mounted to a mounting construction 58, which in Fig. 3a is illustrated as a massive building wall.

[0076] The kit of parts 52 is thus configured to form a board 55 with a continuous magnetic or magnetizable area 56 in the assembled state, which may for example be mounted to a building wall 58 located in the entrance area of a grocery store. The fire-resisting coating layer of the panels 54a-g ensures that the panels 54a-g fulfill the B1-tests according to DIN 4102-1 and 4102-16, so that the magnetic board 55 may be located in spaces open to the public.

[0077] Board 55 provides a magnetic or magnetizable area to which sheets 59, 60 with a layer comprising magnetizable or magnetic material, respectively, can be attached to in a very easy manner and without wrinkles. Board 55 also allows attaching sheets 59, 60 of different sizes. Posters and billboards may thus easily be attached to the board and exchanged on a frequent basis without the need for additional mounting means such as adhesive tape or pins.

[0078] Figure 4a-b show further exemplary embodiments of the panels and of the kit of parts for assembling a magnetic or magnetizable board. Fig. 4a shows a top view and Fig. 4b shows a front view of the panels and the kit of parts in an assembled state.

[0079] The kit of parts 72 in Fig. 4b is a kit of parts for assembling a mobile booth wall and comprises a plurality of panels 74a-g and a collapsible booth frame structure as mobile mounting construction 76. The panels 74a-g may for example have a structure like panels 2 or 32 as described above. The panels 74a-g may be assembled in a predefined arrangement shown in Fig. 4b to form a continuous magnetic or magnetizable board 78.

[0080] Some or all of the panels 74a-g comprise mounting means (not shown), which may for example be designed similar to mounting means 20 or 34 shown in Figs. 1a-b and 2, so that the panels 74a-g or the board 78 assembled therefrom can be mounted to the mobile mounting construction 76 as shown in Fig. 4a.

[0081] The kit of parts 72 therewith provides a system for easily mounting and dismounting a magnetic or magnetizable booth wall 79. Sheets having a layer comprising magnetizable or magnetic material, respectively, can then be attached to the booth wall in a very easy manner without any wrinkles, even if the sheets have a very large size. For example, it is possible to attach to the booth wall 79 a printed sheet 80 with a size essentially covering the full area of the booth wall 79. The printed sheet 80 is preferably a sheet with a back layer comprising magnetizable or magnetic material. The sheet 80 may for example be in a certain corporate color of a company or have a company logo printed thereon so that the booth wall 79 with the sheet 80 attached to it has a desired appearance for the booth of the respective company on a trade fair.

[0082] The sheet 80 may also form part of the kit of parts 72.

[0083] Fig. 5 shows an exemplary embodiment of a system for mounting a panel or a board assembled from a kit of parts to a mounting structure.

[0084] The system 90 comprises a panel 92 similar to panel 2 having a base plate 94 with a sandwich structure having two aluminum layers 96, 98 spaced apart from each other by a plastic layer 100 arranged in between. A magnetic foil 102 is glued onto base plate 94 which is covered by a fire-resisting coating layer 104 similar to layer 18 of panel 2. Panel 92 may be a single panel or part of a board assembled from multiple panels of a kit of parts. Alternatively to a magnetic foil 102, also a magnetizable foil may be used.

[0085] The system 90 further comprises a hook-shaped mounting element 106 with a first end 108 and a second end 110. The first end 108 is insertable into a corresponding reception 112 provided between the two layers 96, 98 of base plate 94 from a side edge 114 of the panel 92.

[0086] A bore hole 116 is provided in the second end 110 of mounting element 106, so that mounting element 106 can be fixedly connected to a mounting construction such as a building wall, in particular by screwing.

[0087] After screwing mounting element 106 to a mounting construction, panel 92 can be arranged such that the first end of mounting element 108 is inserted into reception 112 as shown in Fig. 5. In this arrangement, the second end 110 extends on the backside of panel 92 so that this part of the mounting element 106 is invisible to the beholder of panel 92. Therefore, mounting element 106 allows mounting of panel 92 in an optically appealing manner.

[0088] Fig. 6 shows another exemplary embodiment of the system for mounting a panel or a board assembled from a kit of parts to a mounting structure.

[0089] System 120 also comprises a panel as shown in Fig. 5 so that the same reference numerals are used for the panel and its components. System 120 further comprises a hook-shaped mounting element 122 with a first end 124 and a second end 126, wherein the first end 124 is inserted from a side edge 114 of the panel 92 into reception 112 provided between the two layers 96, 98 of base plate 94. First end 124 of mounting element 122 is glued to the base plate 94 within reception 112. The second end 126 extends to the backside of panel 92. Mounting element 122 can be used to hook panel 92 into a corresponding second mounting element 128 which may be screwed to a mounting construction through bore hole 130. Second mounting element 128 may also form part of system 120.

[0090] Systems 90 and 120 may also be combined to mount panel 92 to a mounting construction. For example, for attaching panel 92 to a wall, system 90 may be used at a lower side edge of panel 92 and system 120 may be used at an upper side edge of panel 92. Panel 92 then remains connected to mounting element 106 and second mounting element 128 by means of gravity.

[0091] Since bore holes 116, 130 are hidden behind the panel 92 they are invisible for the beholder of panel 92 so that systems 90 and 120 provide an optically appealing attachment system for panel 92 or a board assembled from panel 92 and further panels.

[0092] Fig. 7 shows an exemplary embodiment of another system for mounting a panel or a board assembled from a kit of parts to a mounting structure.

[0093] System 140 also comprises a panel as shown in Fig. 5 so that the same reference numerals are used for the panel and its components. System 140 further comprises a mounting element 142 with a holding profile 144 having a laterally arranged reception 146 for receiving therein side edge 114 of panel 92. The mounting element 142 further comprises a connection profile 148 configured for being inserted into a second holding profile 150 with a reception 152 on the face side, which second holding profile 150 may be fixedly connected to a wall for example.

[0094] Holding profiles like the second holding profile 150 having a reception on the face side are conventionally used to mount printed canvas for presentation purposes. System 140 allows using such holding profiles, which may for example be already installed in a place, for mounting panel 92 or a board assembled from panel 92 and further panels. In this way, it is possible to use existing holding profiles for mounting the panel or board. Holding profile 144 preferably extends along the entire side edge 114 of panel 92 and - in case of a board assembled from multiple panels - along the side edge of said board. In particular, system 140 may also be used for more than one side edge of the panel or board, for example for all four side edges in case of a rectangular panel or board.

[0095] An exemplary embodiment of the method for producing a panel will now be described with reference to Fig. 8. For producing a panel like panel 2 shown in Fig. 1b, a base plate 160 is provided which is classified as B1 according to DIN 4102. A suitable base plate 160 is an aluminum dibond with a sandwich structure having two aluminum layers 162, 164 spaced apart from each other by a plastic layer 166 arranged in between.

[0096] One side of base plate 160 (the front side) is then covered with a magnetic foil 168, for example a rubber foil containing ferrite particles. Magnetic foil 168 is preferably attached to the base plate 160 by means of an adhesive. In the alternative, base plate 160 may also be covered with a magnetizable foil, for example a rubber foil containing iron particles.

[0097] The base plate 160 with the magnetic foil 168 attached thereto generally fails the B1 tests as defined in DIN 4102-1 and 4102-16. In order to overcome this problem, a liquid lacquer 170 is applied onto the side of base plate 160 being covered with magnetic foil 168 to form a fire-resisting coating layer 172. The fire-resisting coating layer 172 is preferably applied by roller coating as illustrated in Fig. 8. The roller coater 174 comprises two smaller rollers 176, 178. Liquid lacquer 170 is applied between these two rollers 176, 178 so that a coating layer 180 with uniform thickness forms. The coating layer 180 is then transferred from roller 180 to a larger transfer roller 182 which ultimately applies the coating layer 180 of liquid lacquer 170 to base plate 160 which is moved under transfer roller 182 (as illustrated in Fig. 8 by arrow 184). A pressure roller (not shown) may be present below the base plate 160 to press the base plate against transfer roller 182. The coating layer 172 applied to the base plate 160 in this way is then UV cured and the thus produced panel 186 may finally be used for its designated purpose.

[0098] In one example, the following composition of liquid lacquer 170 has been used:

epoxy acrylates:	40,0 wt.%,
flame retardant fillers:	33,9 wt.%,
defoamer and wetting agent:	1,6 wt.%,
matting agent:	5,5 wt.%,
photo initiator:	4,0 wt.%,
reactive solvent:	15,0 wt.%.

[0099] It was found that the panel 186 produced as described above with this composition of the liquid lacquer 170 fulfilled the B1 tests according to DIN 4102-1 and 4102-16 and is therefore classified as B1. Such a panel is therefore

suitable for being used in places with increased fire safety regulations such as in grocery stores.

Claims

1. Panel (2, 2', 32, 32', 54a-g, 74a-g, 92, 186), in particular wall panel, for attaching thereto a sheet (59, 60) for presentation purposes, the panel preferably being produced with a method according to one of claims 13 to 16, the panel (2, 2', 32, 32', 54a-g, 74a-g, 92, 186) having a back side (4) to be placed against a mounting construction (31, 42, 58, 76) and a front side (6) for attaching thereto a sheet (59, 60),
characterized in

- **that** the panel (2, 2', 32, 32', 54a-g, 74a-g, 92,186) comprises a layer of magnetic or magnetizable foil (16, 102, 168) arranged such that when a sheet (59, 60) with a layer comprising magnetizable or, respectively, magnetic material is attached to the front side (6), the sheet (59, 60) is held in place by means of magnetic force, and
- **that** on the front side (6), the panel (2, 2', 32, 32', 54a-g, 74a-g, 92, 186) is coated with a fire-resisting coating layer (18, 104, 172).

2. Panel according to claim 1,
characterized in that the panel (2, 2', 32, 32', 54a-g, 74a-g, 92,186) comprises a base plate (8, 94, 160), in particular a non-magnetic base plate, the base plate (8, 94, 160) as such being classified as B1 according to DIN 4102, wherein the base plate (8, 94, 160) is covered by the magnetic or magnetizable foil (16, 102, 168).

3. Panel according to claim 2,
characterized in that the base plate (8, 94, 160) has a sandwich structure with two metal layers (10, 12; 96, 98; 162, 164) spaced apart from each other by a plastic layer (14, 100, 166) arranged in between.

4. Panel according to one of claims 1 to 3,
characterized in that the fire-resisting coating layer (18, 104, 172) forms the outermost layer on the front side (6) of the panel (2, 2', 32, 32', 54a-g, 74a-g, 92, 186).

5. Panel according to one of claims 1 to 4,
characterized in that the fire-resisting coating layer (18, 104, 172) is a thermosetting polymer based layer comprising at least 10 wt.%, preferably at least 12 wt.%, in particular at least 15 wt.% of flame retardant fillers.

6. Panel according to one of claims 1 to 5,
characterized in that the fire-resisting coating layer (18, 104, 172) is a layer produced by application of a UV curing epoxy acrylate based lacquer (170), preferably having the following composition in wt.%:

epoxy acrylates:	30 wt.% - 50 wt.%,
flame retardant fillers:	10 wt.% - 20 wt.%,
defoamer and wetting agent:	0 wt.% - 3 wt.%, in particular 1- 3 wt.%,
matting agent:	0 wt.% - 7 wt.%, in particular 3 - 7 wt.%,
photo initiator:	0 wt.% - 6 wt.%, in particular 2 - 6 wt.%,
other constituents:	0 wt.% - 5 wt.%,
reactive solvent:	remainder, in particular at least 30 wt.%.

7. Panel according to one of claims 1 to 6,
characterized in that the panel (2, 2', 32, 32', 54a-g, 74a-g, 92,186) comprises mounting means (28, 34, 106, 122) configured to mount the back side (6) of the panel (2, 2', 32, 32', 54a-g, 74a-g, 92,186) to a mounting construction (31, 42, 58, 76), in particular to a building wall (42, 58) or to a mobile mounting construction (76) such as a booth wall frame.

8. Panel according to one of claims 1 to 7,
characterized in that the panel (2, 2', 32, 32', 54a-g, 74a-g, 92,186) comprises lateral side connection means (20),

in particular of a tongue-and-groove and/or magnet type, configured to connect the panel (2, 2', 32, 32', 54a-g, 74a-g, 92,186) to one or more other panels (2, 2', 32, 32', 54a-g, 74a-g, 92,186) of the same kind.

9. Kit of parts (38, 52, 72) for assembling a magnetic or magnetizable board (40, 56, 78) for attaching thereto a sheet (59, 60) for presentation purposes,

- comprising a plurality of panels (2, 2', 32, 32', 54a-g, 74a-g, 92,186) according to one of claims 1 to 8,
- wherein the panels (2, 2', 32, 32', 54a-g, 74a-g, 92, 186) are configured to form a board (40, 56, 78) with a continuous magnetic or magnetizable area (40, 56, 78), respectively, when arranged next to each other in a predefined arrangement.

10. Kit of parts according to claim 9,
characterized in that the panels (2, 2', 32, 32', 54a-g, 74a-g, 92, 186) comprise corresponding lateral side connection means (20) configured to mutually connect the individual panels (2, 2', 32, 32', 54a-g, 74a-g, 92, 186) to form the board (40, 56, 78).

11. Kit of parts according to claim 9 or 10, further comprising a mobile mounting construction (76), in particular a collapsible booth frame structure, wherein at least one of the panels (2, 2', 32, 32', 54a-g, 74a-g, 92, 186) comprises mounting means (28, 34, 106, 122) configured to mount the board (40, 56, 78) that can be assembled from the panels (2, 2', 32, 32', 54a-g, 74a-g, 92, 186) to the mobile mounting construction (76).

12. System (90, 120) for mounting a panel (2, 2', 32, 32', 54a-g, 74a-g, 92, 186) according to one of claims 1 to 8 or a board (40, 56, 78) assembled from a kit of parts (38, 52, 72) according to one of claims 9 to 11, to a mounting construction (31, 42, 58, 76),

- comprising a panel (2, 2', 32, 32', 54a-g, 74a-g, 92, 186) according to one of claims 1 to 8 or a kit of parts (38, 52, 72) according to one of claims 9 to 11 with such a panel (2, 2', 32, 32', 54a-g, 74a-g, 92,186), wherein the panel (2, 2', 32, 32', 54a-g, 74a-g, 92, 186) has a base plate (8, 94, 160) with a sandwich structure having two metal layers (10, 12; 96, 98; 162, 164) spaced apart from each other by a plastic layer (14, 100, 166) arranged in between, and
- comprising a mounting element (106, 122) configured for being mounted to a mounting construction (31, 42, 58, 76), the mounting element (106, 122) further being partially insertable into a corresponding reception (112) provided between the two metal layers (10, 12; 96, 98; 162, 164) of the base plate (8, 94, 160) of the panel (2, 2', 32, 32', 54a-g, 74a-g, 92,186) from a side edge of the panel (2, 2', 32, 32', 54a-g, 74a-g, 92,186).

13. System (140) for mounting a panel (2, 2', 32, 32', 54a-g, 74a-g, 92,186) according to one of claims 1 to 8 or a board (40, 56, 78) assembled from a kit of parts (38, 52, 72) according to one of claims 9 to 11, to a mounting construction (31, 42, 58, 76),

- comprising a panel (2, 2', 32, 32', 54a-g, 74a-g, 92, 186) according to one of claims 1 to 8 or a kit of parts (38, 52, 72) according to one of claims 9 to 11 with such a panel (2, 2', 32, 32', 54a-g, 74a-g, 92,186), and
- comprising a mounting element (142), the mounting element (142) comprising a first part (148) configured for being partially inserted into a face end reception (152) of a holding profile (150) and comprising a second part (144) comprising a lateral reception (146) for receiving therein a side edge of the panel (2, 2', 32, 32', 54a-g, 74a-g, 92,186) or of the board (40, 56, 78).

14. Method for producing a panel (2, 2', 32, 32', 54a-g, 74a-g, 92, 186) according to one of claims 1 to 8, comprising the following steps:

- providing a base plate (8, 94, 160), which is preferably classified as B1 according to DIN 4102,
- covering a front side (6) of the base plate (8, 94, 160) with a layer of magnetic or magnetizable foil (16, 102, 168), and
- applying a liquid lacquer (170) onto the side of the base plate (8, 94, 160) being covered with the magnetic or magnetizable foil (16, 102, 168) to form a fire-resisting coating layer (18, 104, 172), in particular by roller coating.

15. Method according to claim 14,
wherein the liquid lacquer (170) is a UV curing epoxy acrylate based lacquer comprising at least 10 wt.% - 30 wt.% of flame retardant fillers.

16. Method according to claim 14 or 15,
characterized in that the liquid lacquer (170) has the following composition in wt.%:

epoxy acrylates:	30 wt.% - 50 wt.%,
flame retardant fillers:	10 wt.% - 20 wt.%,
defoamer and wetting agent:	0 wt.% - 3 wt.%, in particular 1- 3 wt.%,
matting agent:	0 wt.% - 7 wt.%, in particular 3 - 7 wt.%,
photoinitiator:	0 wt.% - 6 wt.%, in particular 2 - 6 wt.%,
other constituents:	0 wt.% - 5 wt.%,
reactive solvent:	remainder, in particular at least 30 wt.%.

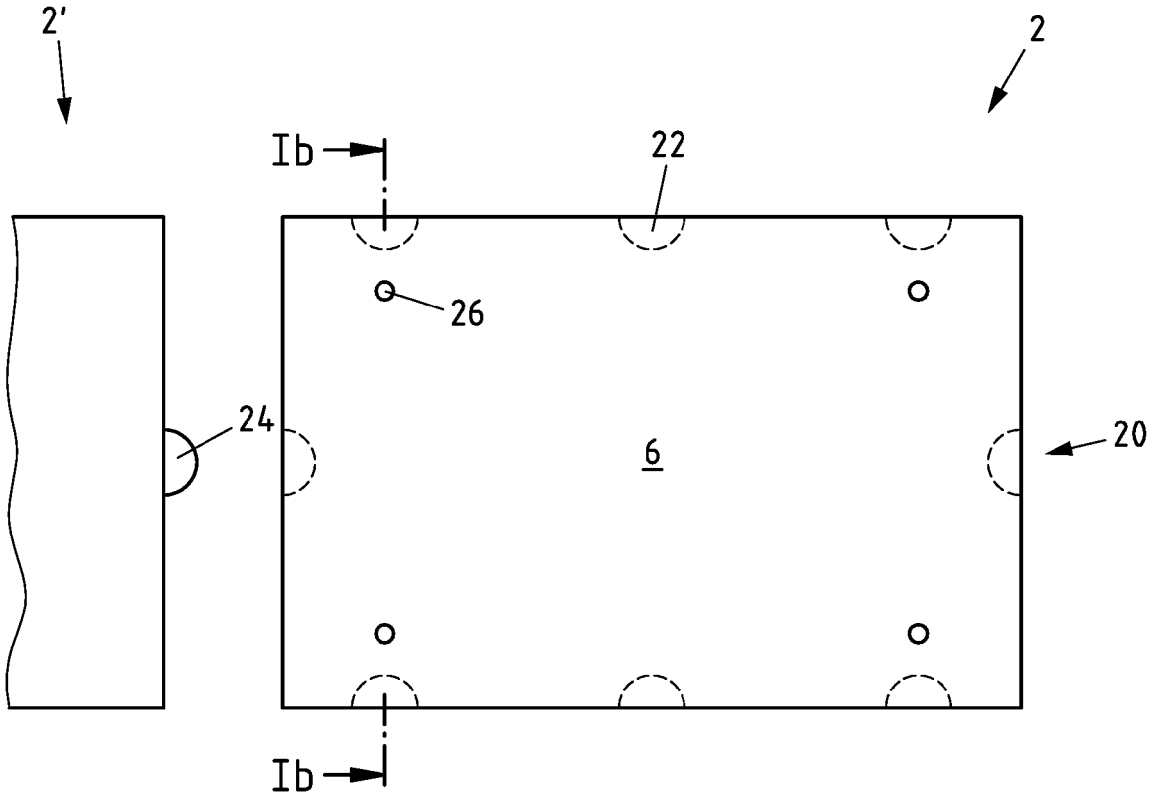


Fig.1a

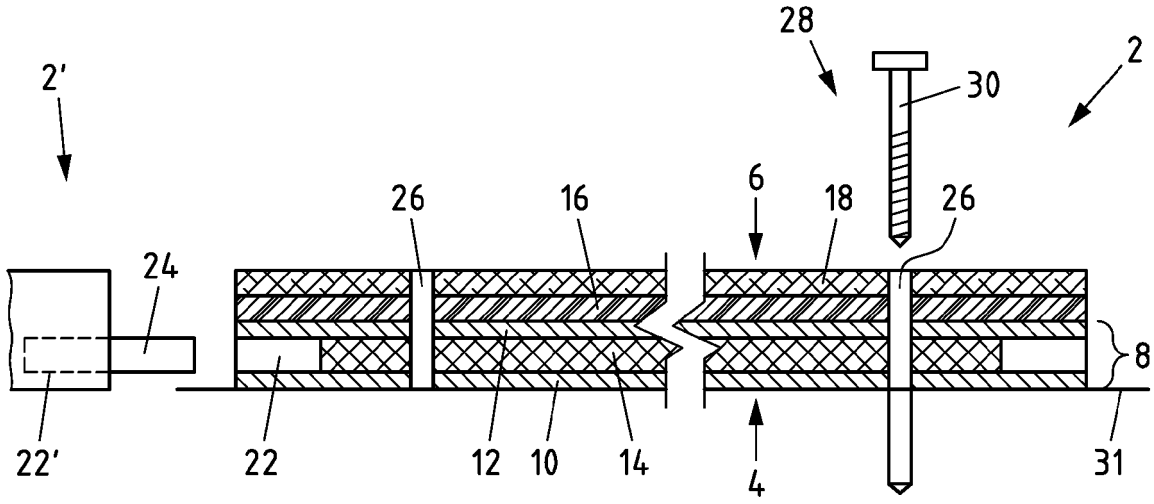


Fig.1b

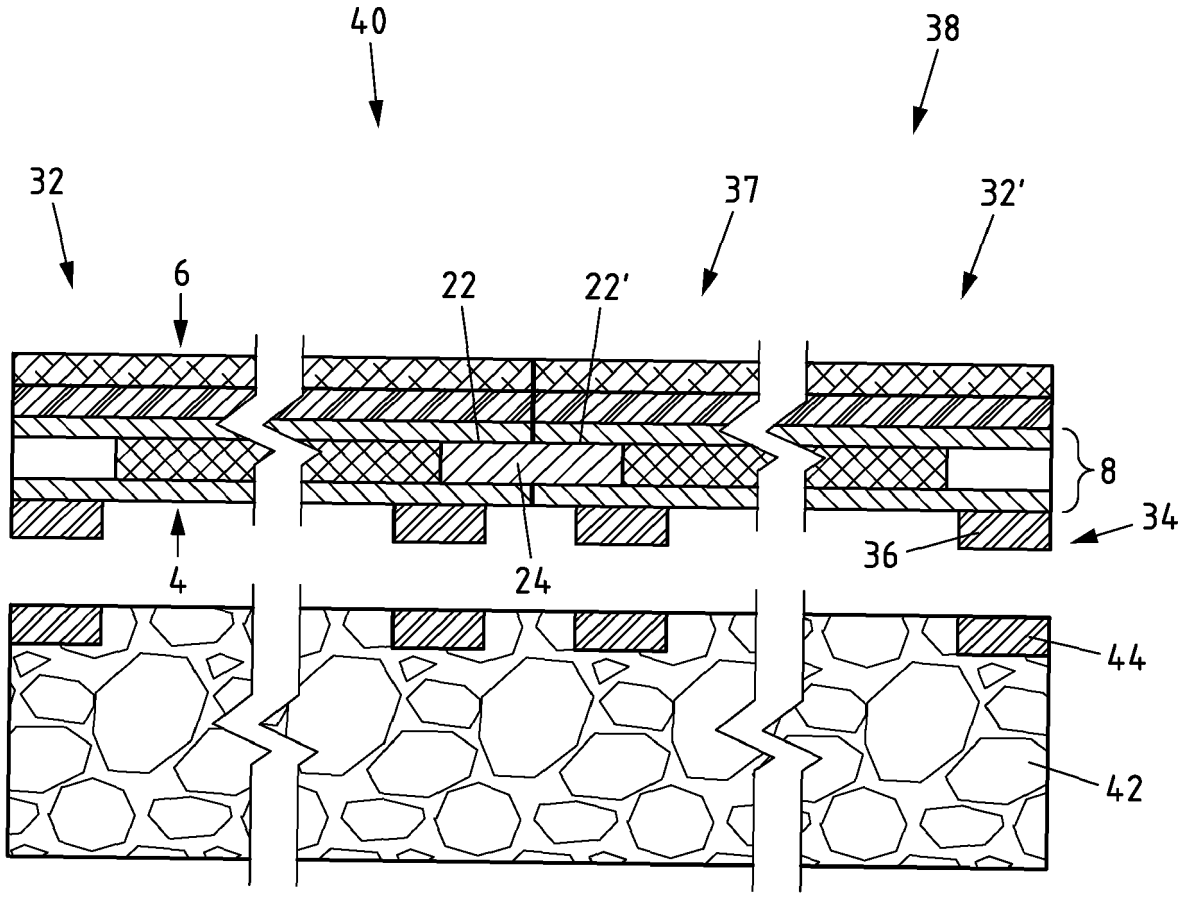


Fig.2

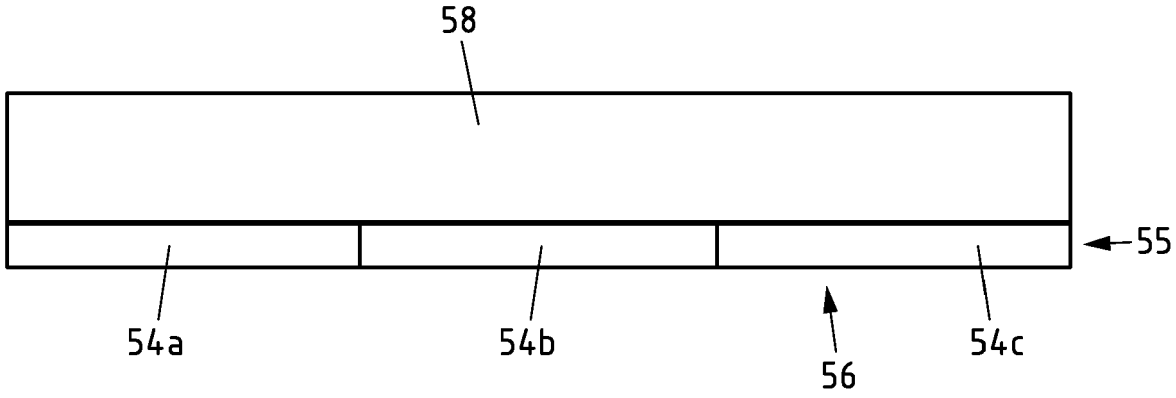
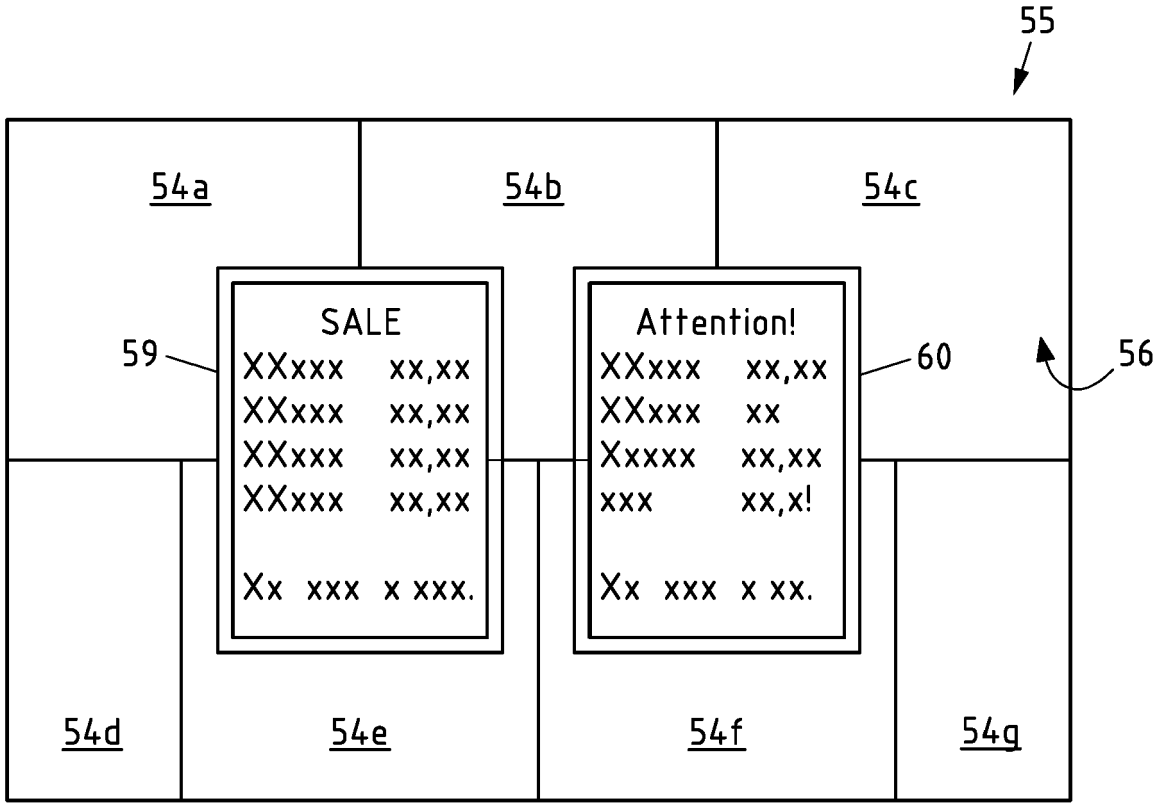

58
55
54a
54b
56
54c

Fig.3a


55
54a
54b
54c
59
SALE
XXxxx xx,xx
XXxxx xx,xx
XXxxx xx,xx
XXxxx xx,xx
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Attention!
XXxxx xx,xx
XXxxx xx
Xxxxx xx,xx
xxx xx,x!
Xx xxx x xx.
60
56
54d
54e
54f
54g

Fig.3b

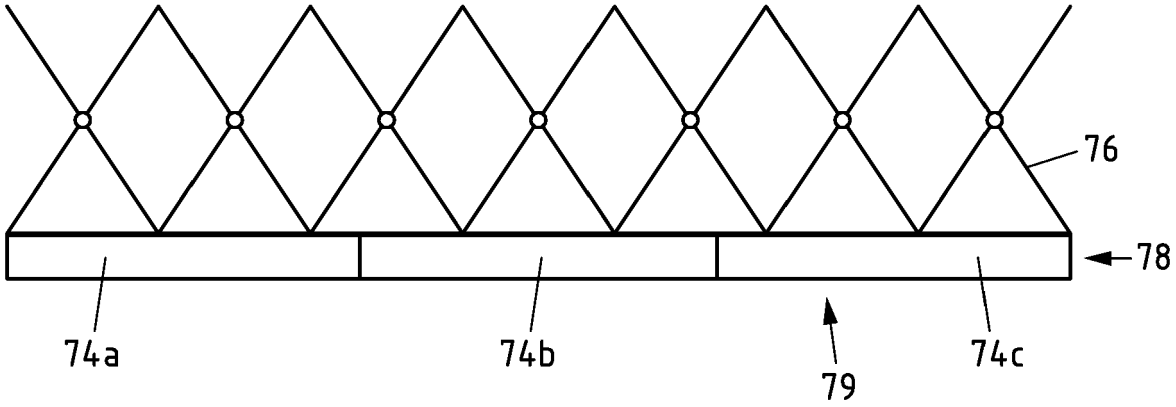
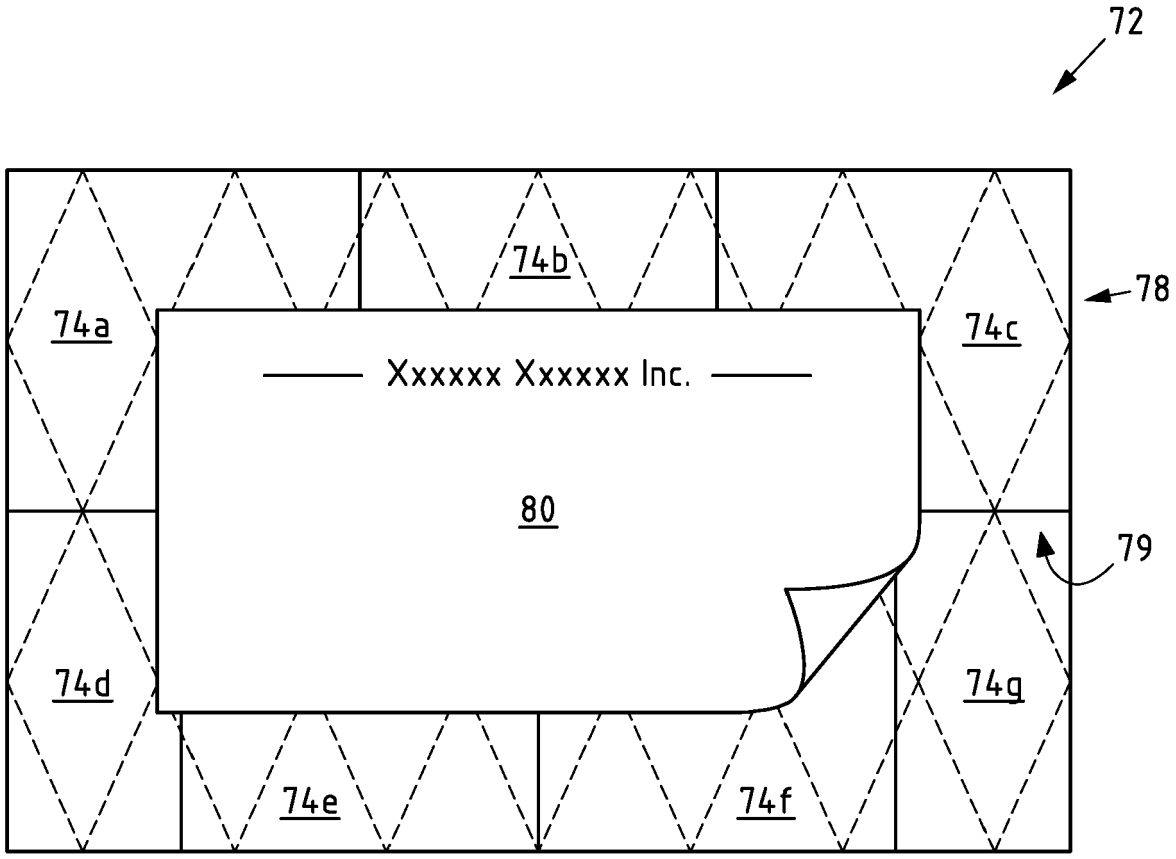

76
78
74a
74b
79
74c

Fig.4a


72
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80
79
74d
74g
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74f

Fig.4b

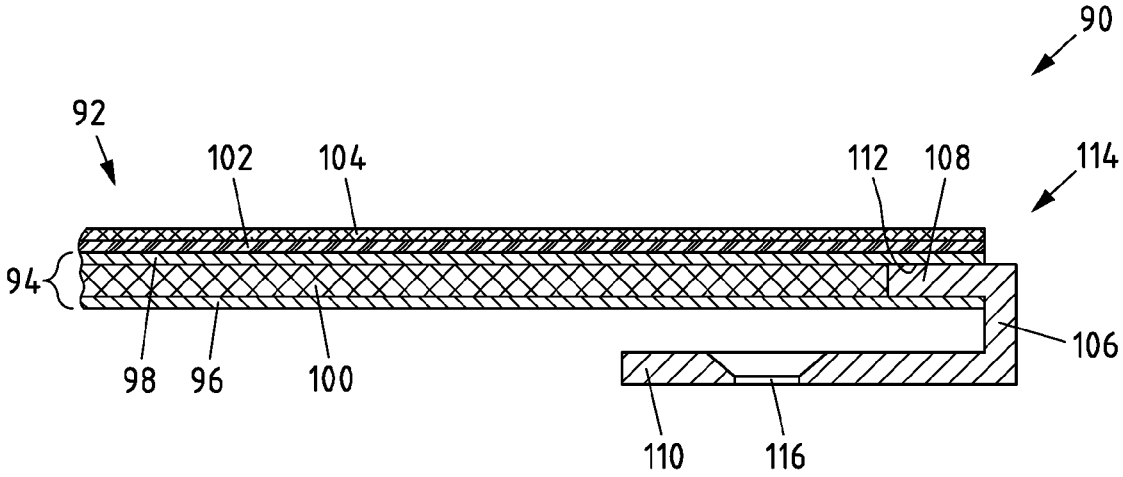

Fig.5

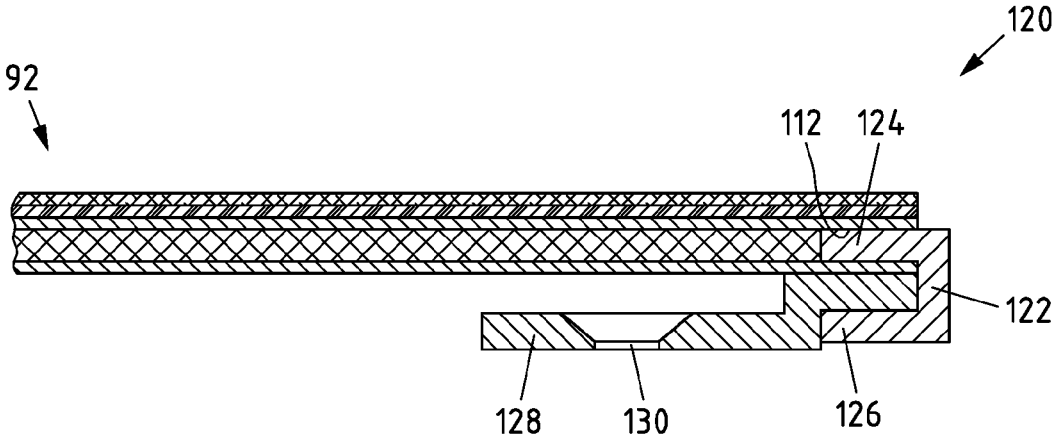

Fig.6

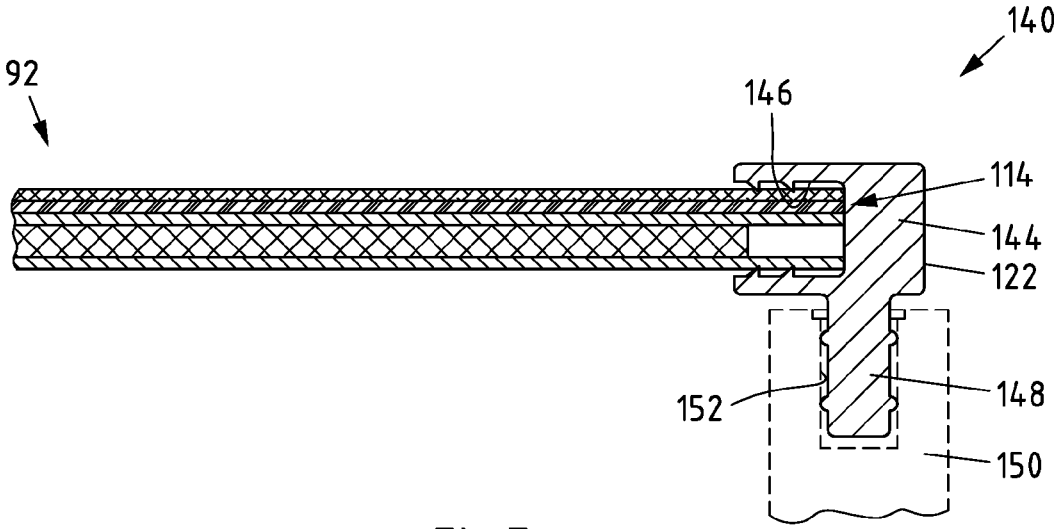

Fig.7

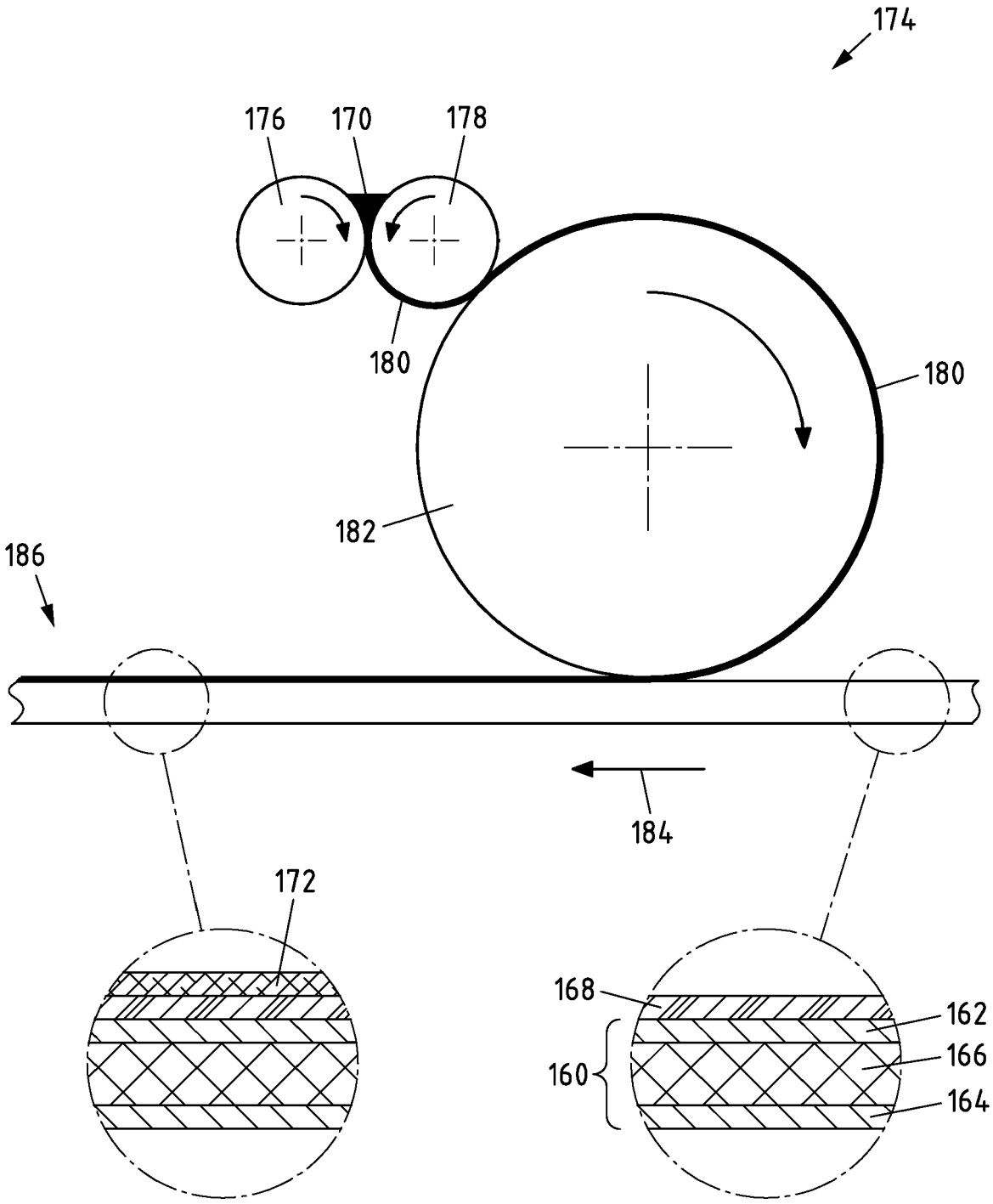

Fig.8

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EUROPEAN SEARCH REPORT

Application Number
EP 16 16 6458

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	CN 204 270 628 U (XI AN CHUANGFAN ADVERTISEMENT CULTURE TRANSMISSION CO LTD) 15 April 2015 (2015-04-15) * abstract; figures 1-6 *	1-16	INV. G09F7/04
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A	GB 2 436 811 A (MARTIN EDWARD DANIEL [ES]) 10 October 2007 (2007-10-10) * page 1, line 1 - line 5 * * page 3, line 24 - line 30 * * page 4, line 12 - line 24 * * figures 1-4 *	1-16	
A	US 4 125 653 A (MUZIK GLENN M) 14 November 1978 (1978-11-14) * column 4, line 53 - column 5, line 59 * * figures 1-8 *	1-16	
A	US 6 298 591 B1 (HEALY DONALL B [US]) 9 October 2001 (2001-10-09) * the whole document *	1-16	TECHNICAL FIELDS SEARCHED (IPC) G09F B32B B43L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	23 September 2016	Pantoja Conde, Ana

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23-09-2016

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