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(54) **ELECTRONIC SHELF LABEL**

(57) An electronic shelf label (ESL) (100), a method for manufacturing an ESL, and an arrangement for securing an ESL to an elongated support member are provided. The ESL comprises a housing (110), and an ESL assembly (90) comprising at least a display (120) and a battery holder (130). The housing (110) comprises a front part (111) formed by a first sheet and a rear part (114) formed by a second sheet and comprising a recessed portion (116) configured to house the battery holder (130). A section of the front part (111) is folded around the rear part (114) with the ESL assembly (90) sandwiched therebetween to permanently secure the front (111) and rear parts (114) together.

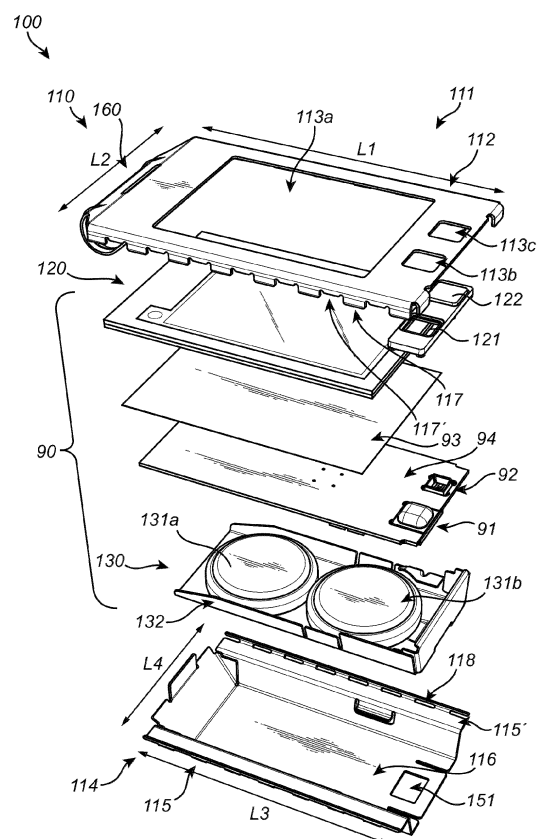


Fig. 1A

Description

Technical field

[0001] The present disclosure relates to the technical field of electronic shelf labels for displaying information, and more specifically to a casing for an electronic shelf label.

Background

[0002] In many different types of stores, for example supermarkets etc., electronic shelf labels, also named ESLs, are used for displaying information about the different products offered in the store. The information displayed is for example the name and type of product as well as the price for each of the products.

[0003] The electronic shelf labels are communicating with a central control unit that makes it possible to frequently update, and change the information displayed on the labels which saves a considerable amount of time for the people working in the store, especially if the number of different products sold in the store is high. As an example, a supermarket may offer between 5,000 and 20,000 different products.

[0004] Different types of systems are used to support the electronic shelf labels to make them easy for the customer to see, and to make it possible to restructure the different items offered for sale and the electronic shelf labels accordingly. One frequently used support element is an elongated rod extending from a shelf, a wall structure or a stand to make it possible to arrange the electronic shelf label closer to the customer. The rod could also be used to hang items on. In some examples the elongated rod is ended by a substantially straight end element such that the elongated rod and end element will have a T-shape. In other examples, the elongated rod consists of two parallel elongated rods, separated by a distance. The parallel rods may be joined by a substantially straight end element or simply extend separately from the wall structure or similar. The support elements may be intended to support an ESL at the outer end of the same.

[0005] However, present solutions may pose a problem in terms of refilling and/or removing items from said support elements. Present solutions are not very space efficient and the ESL sometimes needs to be removed prior to refilling an item, in order for the item(s) to be put on the elongated rod. This is both time consuming and may impair the customer experience.

Summary

[0006] In view of at least the above identified drawbacks, the inventors have reached the insight that there is a need for an electronic shelf label (ESL) configured to be mounted on an elongated rod in a way that allows items to be refilled and removed from the elongated rod

without having to remove or support the ESL. An item intended to be hung on a peg hook, for example a bag of candy, often has a hole in the top of the bag with a size corresponding to that of the peg hook. Existing ESLs are often not space efficient, meaning for example that they are too wide to fit an item over, in order to hang said item on the elongated rod. In other examples, existing ESLs have a thickness that exceeds the size of the hole in the item intended for the peg hook.

[0007] The present disclosure provides an ESL with a housing, a method for manufacturing the ESL, and an arrangement for securing the ESL to an elongated support member in the independent claims, that at least partially mitigates the above-mentioned drawbacks. Preferred embodiments are defined in the dependent claims.

[0008] Hence, according to a first aspect of the invention, there is provided an electronic shelf label (ESL) comprising a housing, and an ESL assembly comprising at least a display and a battery holder. The housing comprises a front part formed by a first sheet having a first edge around the outer periphery of said sheet. The sheet further comprises an opening with a shape and size corresponding to the display. The housing further comprises a rear part formed by a second sheet having a second edge around the outer periphery of said sheet. The rear part further comprises a recessed portion configured to house the battery holder. At least a section of the first edge is folded around the second edge with the ESL assembly sandwiched therebetween to permanently secure the front and rear part together.

[0009] According to a second aspect of the present disclosure, there is provided a method for manufacturing an ESL. The method comprises the step of arranging an ESL assembly between an unfolded first sheet and a second sheet, with the display facing the opening of the front part. The method further comprises the step of pressing the first edge of the first sheet such that the first edge is folded around the second edge.

[0010] According to a third aspect of the present disclosure, there is provided an arrangement for securing an electronic shelf label (ESL) to an elongated support member with a transverse member with a substantially circular cross section and a width W. The arrangement comprises an ESL with a housing according to the first aspect of the invention, and a hook configured to be attached to the housing. The hook comprises a substantially circular interior with an internal radius corresponding to a radius of the elongated support member, and an opening intended to face downwards, such that the hook is arrangeable around said elongated support member. The hook may be made from a flexible material, such that the hook can be arranged around said elongated support member by a snap-fit arrangement. The opening may thus have a smaller width than the diameter of the elongated support member. Further, the width of the housing and hook is less than or equal to the width W of the elongated support member.

[0011] By the term "elongated support member" or

"elongated rod" is herein meant a type of support member intended for arranging the electronic shelf label closer to the customer. The elongated support member may extend from a shelf, a wall structure or a stand. The support member or rod could also be used to hang items on. An example of an elongated support member is a peg hook.

[0012] Thus, there is provided an ESL, a method for manufacturing said ESL, and an arrangement comprising said assembly, with the function to provide an ESL that is space efficient, easy to mount on an elongated support member and easy to manufacture, while providing correct information via the display to a customer. A number of advantages can be associated with providing such an ESL, one of them being that the personnel working in the store may save time that can instead be spent on other tasks, and another one being an improved customer experience.

[0013] Furthermore, the ESL housing is formed of two sheets of material, meaning that only a small amount of material is needed to manufacture the housing of the ESL. This enables the ESL to be both lightweight and space efficient. The first and second sheets may for example be made out of metal, and for example aluminum. The first and second sheets may also be made of another material suitable for being produced in sheets. Further, the first and second sheets are foldable. Folding the edges of the first sheet around the second sheet as a securing mechanism saves space by removing the need for an additional component intended for securing the first and second sheets together. This means that both the utilization of material and space can be minimized. For example, a sheet made of metal can be produced with a small thickness, why the ESL housing can be formed taking up a minimum amount of space. The ESL housing can thus be designed to be slim, almost like a sleeve around the ESL assembly in order to maximize the space efficiency of the ESL.

[0014] Even further, the ESL may be manufactured to have a width that is equal to or smaller than the width of the peg hook or support element that it is intended to be mounted on. An ESL having the same or a smaller width than the peg hook allows for an item to be hung on the peg hook or removed from the same, without the need to remove the ESL prior. The ESL may thus have a size adapted to fit in the hole of said item, such that the item can be pulled over the ESL without the ESL falling off the peg hook. Further, placing the ESL directly on the peg hook or other type of elongates support member enables the ESL to be as close as possible to the customer. Since the ESL displays information important for the customer, this is advantageous since it minimizes the risk of the customer missing important information, impairing their experience in the store.

[0015] The ESL in the present disclosure comprises a housing having a front part and a rear part. The front part has an opening corresponding to a size of the display of the ESL assembly. For example, the display may be substantially rectangular, and thus the opening of the front

part may also be rectangular such that the display is visible through the opening when they are aligned. Furthermore, the front part is made of a first sheet. The first sheet may for example be a metal sheet or a plastic sheet.

5 According to a preferred embodiment, the first sheet forming the front part is made of sheet metal. The metal may for example be aluminum. The metal sheet that is the first sheet may have a thickness between 0.2mm and 0.8mm.

10 **[0016]** Further, the rear part is made of a second sheet. In one example, the first sheet of the front part and the second sheet of the rear part are made of the same material, for example two metal sheets.

[0017] In another example, the front part and the rear part are made of different materials. The rear part has a recessed portion configured to house the battery holder. In one example, the recessed portion is formed by depressing a part of the sheet during manufacturing. This example may be applicable if the rear part is a metal sheet. In another example, The rear part may also be formed by casting. In this example, the rear part may be made from a plastic material, the second sheet being a plastic sheet. The recessed portion may constitute a majority of the area of the second sheet that is the rear part. In another example, the recessed portion may constitute a minority of the area of the second sheet that is the rear part.

[0018] Further, the front part has an unfolded state and a folded state. The unfolded state may be the state before the ESL assembly is secured in the housing. In the unfolded state, the section of the first sheet of the front part is not yet folded around the second edge of the second sheet of the rear part. The folded state may be when the front part and the rear part are secured together with the ESL assembly sandwiched therebetween. In the folded state, the section of the first sheet of the front part is folded around the second edge of the second sheet of the rear part.

[0019] According to an embodiment, the housing further comprises a hook integrally formed with said first sheet and extending from one side of the first edge of said first sheet. Thus, the hook may be formed from the same first sheet as the front part.

[0020] According to an embodiment, the hook is a separate component attachable to one of the front part and the rear part. The hook may for example be made of plastic or metal. The hook may be attached to the front part with an adhesive, for example an epoxy, or with a snap-fit arrangement. The hook may also be attached to the rear part, for example also with an adhesive such as epoxy, or a snap-fit arrangement. This is advantageous in that the hook may be varied in size and shape, and the best suited hook for the application can be chosen using the same ESL.

55 **[0021]** In the example where the front part is substantially rectangular, the hook may be arranged on one side of the rectangular front part or rear part. For example, the hook may extend from one of the shorter sides of the

rectangle. The hook may be intended for arranging the ESL on an elongated rod. The hook may be formed by folding the first sheet such that a hook shape is formed in one side of the first sheet. This may be performed while the front part is in the unfolded state. Moreover, the hook may comprise a substantially circular interior with an internal radius corresponding to a radius of the elongated support member. The hook may also comprise an opening intended to face downwards while exceeding the double radius of the elongated support member such that the hook is arrangeable around said elongated support member. This is advantageous in that the ESL can be arranged on the elongated rod in an efficient way. Moreover, forming the hook and the front part from the same first sheet enables an efficient use of material. Further, it requires one less manufacturing step, since the step of fastening of the hook on the first sheet can be skipped.

[0022] According to an embodiment, the first sheet and the second sheet are formed by the same single sheet. The single sheet is folded to form the front part and the rear part. The single sheet may be cut out as one piece from the same material, for example metal or plastic. This embodiment is advantageous in that it enables an increased efficiency of the manufacturing process.

[0023] According to an embodiment, the first edge is divided in a plurality of sections. The sections may be distributed along the entire periphery of the sheet, i.e. all sides of the sheet. Further, the plurality of sections may differ between the different sides of the sheet. For example, one side of the sheet may be divided into five or more sections, while another side of the sheet may be divided into five or less sections. The plurality of sections may be uniform in their size and shape. In another example, the plurality of sections are not uniform in their size and shape, but have different sizes and shape. The shape of the sections may be rectangular, triangular or round. It should be noted that shapes other than the previously mentioned are possible. Further, one section of the edge is smaller than the entirety of the edge, resulting in less material to fold. This is advantageous in that it requires less force to fold a smaller section of material, than folding the entire edge. Further, dividing the edge into a plurality of sections enables saving of material while maintaining the strength of the fastening between the front and rear part of the housing.

[0024] According to an embodiment, the second edge further comprises at least one aperture configured to receive at least one of the sections of the first edge, in an unfolded state of the first sheet. In one example, the at least one aperture is a hole cut out from the second sheet. The at least one aperture may be cut out from the second sheet on the second edge of the second sheet that is not taken up by the recessed portion. The at least one aperture may have a width corresponding to a width of the second edge. If the rear part is substantially rectangular, for example, the second edge may be flange around the sides of the substantially rectangular shape. The at least one aperture may then be at least one aperture per side

of the second edge. In one example, the at least one aperture is one aperture. In another example, the at least one aperture is one aperture per side of the second edge.

[0025] According to a preferred embodiment, the at least one aperture is a plurality of apertures corresponding to the number of sections in the plurality of sections. Thus, the apertures may be holes that has a size and shape corresponding to that of the plurality of sections of the first edge. The plurality of sections of the first edge may be inserted into the apertures in the unfolded state of the first sheet, i.e. before the plurality of sections of the first edge is folded. This is advantageous in that it facilitates the positioning of the front and the rear part, such that they are correctly positioned in relation to each other before securing the front and rear parts together. Furthermore, it enables a safer securing of the front and rear parts, since inserting the plurality of sections into the at least one aperture prevents the front and/or the rear parts to slide in relation to each other, minimizing the risk of the ESL housing being disassembled.

[0026] According to an embodiment, the front part, the ESL assembly and the rear part are stacked on top of each other with the display facing the opening of the front part. This is advantageous in that the ESL assembly and the housing may be assembled in the same step. This is further advantageous in that the amount of tools needed to assemble the ESL assembly and the housing decreases. Further, the manufacturing time may be decreased, yielding a more efficient manufacturing process. The ESL may be assembled using a tool that presses the first edge of the first sheet in its unfolded state, folding the plurality of sections around the second edge of the second sheet. This may be performed when the components of the ESL are stacked as explained above. The tool used for pressing may be any tool suitable for pressing metal sheets.

[0027] According to an embodiment, the ESL has a substantially rectangular shape. A rectangular shape is easy to manufacture since it does not include any negative angles or shapes. Further, since an item should be able to be pulled over the ESL, it is advantageous that the ESL is of a shape that does not risk to get stuck in the item, such as a shape with pointy edges or similar. Furthermore, the substantially rectangular shape may be the shape of the ESL as seen from the front part of the ESL. The ESL has a thickness, forming an ESL that has a substantially rectangular box-shape, for example.

[0028] According to an embodiment, the battery holder is removably arranged in the recessed portion of said rear part. This is advantageous in that the batteries in the ESL assembly may be replaced when discharged, without the need to replace the entire ESL. Replacing only the battery holder with the batteries instead of the entire ESL also saves costs and material waste.

[0029] According to an embodiment, one side of the substantially rectangular shape of the ESL comprises, in a folded state, an opening configured to receive said battery holder. The opening is formed by the recessed portion. The side where the opening is arranged may there-

fore coincide with the side of the ESL where the recessed portion of the rear part is located. The side may be open such that there is room a user to replace and removing the battery holder without having to unfold the front and the rear parts of the housing, or having to remove the entire ESL assembly from the housing in order to reach the battery holder.

[0030] According to an embodiment, the recessed portion of the rear part further comprises a snap-fit arrangement configured to removably attach the battery holder. This is advantageous in that the battery holder may be firmly secured in the ESL assembly while still being removable. Furthermore, a snap fit may give out a sound when the snap-fit parts in the snap-fit arrangement are secured together. This may ensure a user that the battery holder is properly secured in its place. This further minimizes the risk of the battery holder and the batteries being poorly inserted, and the ESL assembly display not being powered, resulting in it not being able to display information.

[0031] According to a further embodiment, the snap-fit arrangement comprises a female part and a corresponding male part, wherein one of the female or male part is arranged on the recessed portion of the rear part, and the other one of the male or female part is arranged on the battery holder. For example, the female part may be arranged on the rear part, and the male part on the battery holder. The female part may be an aperture or hole in the rear part. The male part may be a peg or a flap protruding from the battery holder. The male part may be of the same shape and size as the female part, creating a snap-fit between them when engaged. A user may then release the snap-fit by pressing on the male part of the battery holder, such that the male part is pushed out from the female part.

[0032] According to an embodiment, the battery holder is slidably arranged in the rear part of the housing to engage with said snap-fit arrangement. This is advantageous in that a user may only have to slide the battery holder inside the opening of the ESL to reach the ESL assembly, or rear part of the housing in order to engage the snap-fit arrangement. This is advantageous in that it facilitates the replacement of batteries in the ESL assembly. A sliding movement does not require a large amount of force, why the batteries of the ESL assembly may be replaced by a wider range of users, and does not require any special skills.

[0033] It is noted that other embodiments using all possible combinations of features recited in the above described embodiments may be envisaged. Thus, the present disclosure also relates to all possible combinations of features mentioned herein. Any embodiment described herein may be combinable with other embodiments also described herein, and the present disclosure relates to all combinations of features.

Brief Description of the Drawings

[0034] Exemplifying embodiments will now be described in more detail, with reference to the following appended drawings:

Figures 1a-b illustrates exploded views of an ESL according to the present invention;

Figures 2a-b illustrates perspective views of an ESL according to the present invention.

Detailed Description

[0035] As illustrated in the figures, the sizes of the elements and regions may be exaggerated for illustrative purposes and, thus, are provided to illustrate the general structures of the embodiments. Like reference numerals refer to like elements throughout.

[0036] Exemplifying embodiments will now be described more fully hereinafter with reference to the accompanying drawings, in which currently preferred embodiments are shown. The invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided for thoroughness and completeness, and fully convey the scope of the invention to the skilled person.

[0037] With reference to Figure 1a an ESL 100 in accordance with an embodiment of the present invention is disclosed. The ESL 100 comprises a housing 110 with a front part 111 and a rear part 114. The front part 111 has a first edge 112 around the periphery of the same. As seen in the figure, the front part 111 is made of a first sheet. The front part 111 further comprises an opening 113a which is substantially rectangular. The ESL 100 further comprises an ESL assembly 90 with a display 120 and a battery holder 130. The size of the opening 113a corresponds to that of the display 120. The display 120 also has a substantially rectangular shape. Further, the first edge 112 has a plurality of sections 117 distributed along a portion of the first edge 112 of the front part 111. The plurality of sections 117 has a substantially rectangular shape with rounded edges. The plurality of sections 117 differ in size, where every other section 117' has a smaller height than the other. As seen in the figure, the plurality of sections 117 forms a toothlike silhouette along the portion of the first edge 112 of the front part 111. The front part 111 as shown in the figure, has two longer sides L1 and two shorter sides L2. On the longer sides L1 the sections 117 are distributed over the entirety of the longer sides L1.

[0038] Further, the present figure shows the ESL 100 in the folded state, i.e. where the plurality of sections 117 of the first edge 112 are folded around the second edge 115 of the rear part 114. The front part 111 further comprises a hook 160. The hook 160 has the same width L2 as the ESL 100. Further, the hook 160 has a substantially circular profile, and extends from one of the shorter sides

L2 of the front part 111. The front part 111 and the hook 160 are formed by the same first sheet.

[0039] Furthermore, the hook 160 has a substantially circular interior with an inner radius R1. The hook 160 is configured to be arranged around an elongated support member (not shown) installed in the store. The elongated support member could for example be a peg hook. The inner radius R1 of the hook 160 corresponds to a radius of the elongated support member (not shown).

[0040] Furthermore, the hook 160 has an opening 162 facing downwards seen from a perspective when the ESL 100 is mounted on the elongated support member. The hook 160 is arranged around the elongated support member and the ESL 100 is hanging down towards the ground from the elongated support member. The size of the opening 162 exceeds the double radius of the elongated support member, i.e. a double radius R1 of the hook 160. In this way, the hook 160 is enabled to be mounted around the elongated support member.

[0041] The front part 111 of the housing 110 as shown in Figure 1a comprises two additional openings 113b, 113c. These openings 113b, 113c are intended to display a LED light source 91 and a sensor 92 arranged on the ESL assembly 90. The ESL assembly 90 shown in the figure is formed by a display 120 arranged in one layer. The display layer further comprises two covered openings 121, 122 intended for the LED light source 91 and the sensor 92. The covered openings 121, 122 are covered with a transparent film or sheet, in order to protect the LED light source 91 and the sensor 92. The transparent film may for example be made of plastic. The ESL assembly 90 further comprises an attachment layer 93 configured to attach the display layer with the circuit board 94. The attachment layer 93 may for example be tape, or an adhesive. Beneath the attachment layer 93 in the present figure, there is a circuit board 94. The circuit board comprises 94 the electronics of the ESL assembly 90. Furthermore, the LED light source 91 and the sensor 92 are arranged in the circuit board 94. The sensor 92 could for example be an antenna, an IR sensor or a wi-fi transmitter/receiver. Further, the ESL assembly comprises a battery holder 130. The battery holder 130 as shown in figure 1a comprises two batteries 131a, 131b. The batteries 131a, 131b could for example be standard button cell batteries. The battery holder 130 has a substantially rectangular shape. Around the periphery of the battery holder 130 there is a flange 132.

[0042] The rear part 114 of the housing 110 has a second edge 115 around the periphery of the same. The rear part 114 may be formed by a sheet of plastic, that is cast to achieve the present shape. The rear part 114 may also be formed by a metal sheet. The rear part 114 further comprises a recessed portion 116. The recessed portion 116 is substantially rectangular, and configured to house the battery holder 130. The recessed portion 116 is formed in the sheet by for example casting. The rear part 114 as seen from above (as in the present figure) is substantially rectangular with two shorter sides L4 and two

longer sides L3. The second edge 115 comprises a skirt 115' along the two longer sides L3 of the rear part 114. The skirt 115' protrudes from the second edge 115. In the skirt 115' there are a plurality of apertures 118 arranged, which are distributed along the two longer sides L3 of the second edge 115. The size of the apertures 118 corresponds to a size of the plurality of sections 117 of the first edge 112, such that the plurality of sections 117 can be inserted into the apertures 118 in the unfolded state of the first sheet. The number of apertures 118 corresponds to the number of sections 117. The plurality of sections 117 are inserted into the plurality of apertures 118 in an unfolded state, and when folded, the plurality of sections 117 are folded around the second edge 115, securing the ESL assembly 90 therein.

[0043] The recessed portion 116 comprises a part of a snap-fit arrangement 150 configured to mate with the battery holder 130. The recessed portion 116 comprises a female part 151 of said snap-fit arrangement 150. The female part 151 is an opening in the recessed portion 116. The female part 151 is arranged in one end of the recessed portion 116. The battery holder 130 comprises a corresponding male part 152. The male part 152 is a peg protruding from the battery holder 130. The male part 152 is arranged in one end of the battery holder 130. The male part 152 and the female part 151 are arranged in the same end of the ESL, such that they are aligned with each other when the ESL 100 is assembled. The female 151 and male 152 parts are engaged with each other by inserting the protruding peg that is the male part 152 into the opening that is the female part 151, creating a snap-fit engagement. The female 151 and male 152 parts are disengaged from each other by a user pressing the male part 152 such that it is ejected from the female part 151. In this way the battery holder 130 is inserted and removed from the housing 110.

[0044] Alternatively, as shown in figure 1a, the rear part 114 and the battery holder 130 comprises a second snap-fit arrangement 155. The second snap-fit arrangement 155 comprises a first part 156 arranged on the rear part 114. The first part 156 is an opening with a peg protruding partly inwards towards the recessed portion 116. The second part 157 of the second snap-fit arrangement 155 is arranged on the battery holder 130. The second part 157 is a section of the flange 132 of the battery holder 130. The first part 156 and the second part 157 are engaged by the first part 156 being pressed against the second part 157. The peg protruding partly inwards 156 towards the recessed portion 116 is configured to, when engaged with the section of the flange 157, by resting on top of the section of the flange 157, locking it in place. The second snap-fit arrangement 155 ensures that the battery holder 130 is secured in a height direction inside the ESL housing 110. The height direction is defined as the direction following an axis from a bottom of the rear part 114, through the ESL assembly 90 to the front part 111. The second snap-fit arrangement 155 prevents the battery holder 130 from moving in the height direction,

minimizing the risk of the battery holder 130 being dislocated or damaged.

[0045] With reference to Figure 1b, an ESL 100 in accordance with an embodiment of the present invention is disclosed. The present figure shows the same ESL 100 as seen in figure 1a, but from a different view, seeing the ESL 100 from below opposite to from above as in figure 1a. As earlier described, the hook 160 has a substantially circular interior with an inner radius R1 where the inner radius R1 of the hook 160 corresponds to a radius of the elongated support member (not shown). Furthermore, the opening 162 of the hook 160 is shown.

[0046] Further, figure 1b shows that the display layer further comprises a connector assembly 99 arranged on the bottom side of the display layer. The connector assembly 99 is configured to connect the display 120 with the circuit board 94. The connector assembly 99 may be a flexible printed circuit connector or a ribbon connector, for example. The electronics of the display 120 are collected in the connector assembly 99 and attached to the bottom side of the display layer, which is connected with the circuit board 94. Further, the circuit board 94 with the electronics of the ESL assembly 90 is shown in figure 1b.

[0047] With reference to Figure 2a, an ESL 100 in accordance with an embodiment of the present invention is disclosed, in an assembled state. The ESL 100 is seen from a view showing the bottom of the rear part 114. The plurality of sections 117 of the first edge 112 are inserted into the plurality of apertures 118 and then folded around the second edge 115 such that the front 111 and rear 114 parts are secured together. Furthermore, the first snap-fit arrangement 150 and the second snap-fit arrangement 155 are both in an engaged state. Furthermore, the battery holder 130 can be seen inserted into the recessed portion 116.

[0048] With reference to Figure 2b, an ESL 100 in accordance with an embodiment of the present invention is disclosed, in an assembled state. The ESL 100 is seen from a view showing the top of the front part 111 with the display 120 visible through the opening 113a. Further, the covered openings 121, 122 are visible through the openings 113b and 113c.

[0049] Although features and elements are described above in particular combinations, each feature or element can be used alone without the other features and elements or in various combinations with or without other features and elements.

[0050] Additionally, variations to the disclosed embodiments can be understood and effected by the skilled person in practicing the claimed invention, from a study of the drawings, the disclosure, and the appended claims. In the claims, the word "comprising" does not exclude other elements, and the indefinite article "a" or "an" does not exclude a plurality. The mere fact that certain features are recited in mutually different dependent claims does not indicate that a combination of these features cannot be used to advantage.

Claims

1. An electronic shelf label (ESL) (100) comprising a housing (110), and an ESL assembly (90) comprising at least a display (120) and a battery holder (130), said housing (110) comprising:
 - a front part (111) formed by a first sheet having a first edge (112) around the outer periphery of said sheet, and comprising an opening (113a) with a shape and size corresponding to the display (120);
 - a rear part (114) formed by a second sheet having a second edge (115) around the outer periphery of said sheet, and comprising a recessed portion (116) configured to house the battery holder (130),
 - wherein at least a section of the first edge (112) is folded around the second edge (115) with an ESL assembly (90) sandwiched therebetween to permanently secure the front part (111) and rear part (114) together.
2. ESL (100) according to claim 1, wherein the battery holder (130) is removably arranged in the recessed portion (116) of said rear part (114).
3. ESL (100) according to claim 1 or 2, wherein the front part (111), the ESL assembly (90) and the rear part (114) are stacked on top of each other with the display (120) facing the opening (113) of the front part (111).
4. ESL (100) according to any of the preceding claims, wherein the housing (110) further comprises a hook (160) integrally formed with said first sheet and extending from one side of the first edge (112) of said first sheet.
5. ESL (100) according to any of the preceding claims, wherein the housing (110) further comprises a hook (160), wherein said hook (160) is a separate component attachable to one of the front part (111) and the rear part (114).
6. ESL (100) according to any of the preceding claims, wherein the first sheet and the second sheet are formed by the same single sheet, and wherein said single sheet is folded to form the front part (111) and the rear part (114).
7. ESL (100) according to any of the preceding claims, wherein the first edge (112) is divided in a plurality of sections (117).
8. ESL (100) according to claim 7, wherein the second edge (115) further comprises at least one aperture (118) configured to receive at least one of the plu-

ality of sections (117) of the first edge (112), in an unfolded state of the first sheet.

9. ESL (100) according to claim 8, wherein the at least one aperture (118) is a plurality of apertures (118) corresponding to the number of sections (117) in the plurality of sections (117). 5
10. ESL (100) according to any of the preceding claims, wherein the ESL (100) has a substantially rectangular shape. 10
11. ESL (100) according to any of the preceding claims, wherein the first sheet forming the front part (111) is made of sheet metal. 15
12. ESL (100) according to claim 10, wherein one side of the substantially rectangular shape comprises, in a folded state, an opening (140) configured to receive said battery holder (130). 20
13. ESL (100) according to any of the preceding claims wherein the recessed portion (116) of the rear part (114) further comprises a snap-fit arrangement (150) configured to removably attach the battery holder (130). 25
14. ESL (100) according to claim 13, wherein the snap-fit arrangement (150) comprises a female part (151) and a corresponding male part (152), wherein one of the female part (151) or male part (152) is arranged on the recessed portion (116) of the rear part (114), and the other one of the female part (151) or male part (152) is arranged on the battery holder (130). 30
15. ESL (100) according to claim 13 or 14, wherein the battery holder (130) is slidably arranged in the rear part (114) of the housing (110) to engage with said snap-fit arrangement (150). 35
16. A method for manufacturing the ESL (100) according to claim 1, the method comprising the steps of: 40
 - a. arranging an ESL assembly (90) between an unfolded first sheet and the second sheet, with the display (120) facing the opening (113) of the front part (111); 45
 - b. pressing the first edge (112) of the first sheet such that the first edge (112) is folded around the second edge (115). 50
17. Method according to claim 16, wherein the first edge (112) is divided in a plurality of sections (117).
18. Method according to claim 17, wherein the second edge (115) further comprises at least one aperture (118) configured to receive at least one of the sections (117) of the first edge (112), in an unfolded 55

state of the first sheet.

19. Method according to claim 18, wherein the at least one aperture (118) is a plurality of apertures (118) corresponding to the number of sections (117) in the plurality of sections (117).
20. Method according to claim 18 or 19, further comprising a step to be carried out prior to step b, the step comprising fitting the at least one of the sections (117) of the first edge (112) in the at least one apertures (118) of the second edge (115).
21. Arrangement for securing an electronic shelf label (ESL) to an elongated support member with a transverse member with a substantially circular cross section and a width W, said arrangement comprising:

An ESL (100) with a housing (110) according to claim 1;
 a hook (160) configured to be attached to the housing (110), the hook (160) comprising a substantially circular interior (161) with an internal radius (R1) corresponding to a radius (R2) of the elongated support member, and an opening (162) intended to face downwards, such that the hook (160) is arrangeable around said elongated support member; and wherein
 a width (W1) of the housing (110) and a width (W2) of the hook (160) is less than or equal to the width W of the elongated support member.
22. Arrangement according to claim 21, wherein the elongated support member is a peg hook. 35

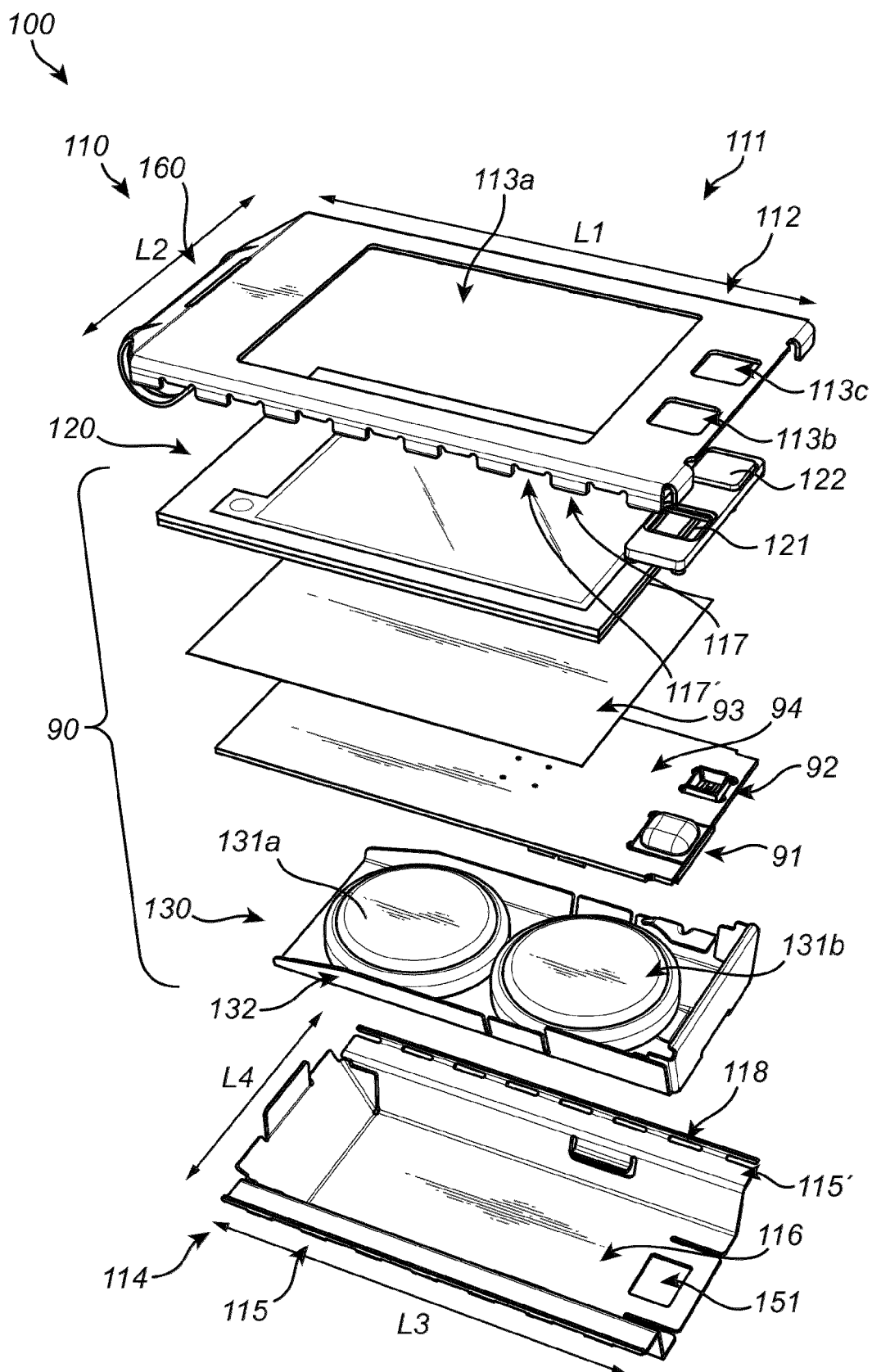


Fig. 1A

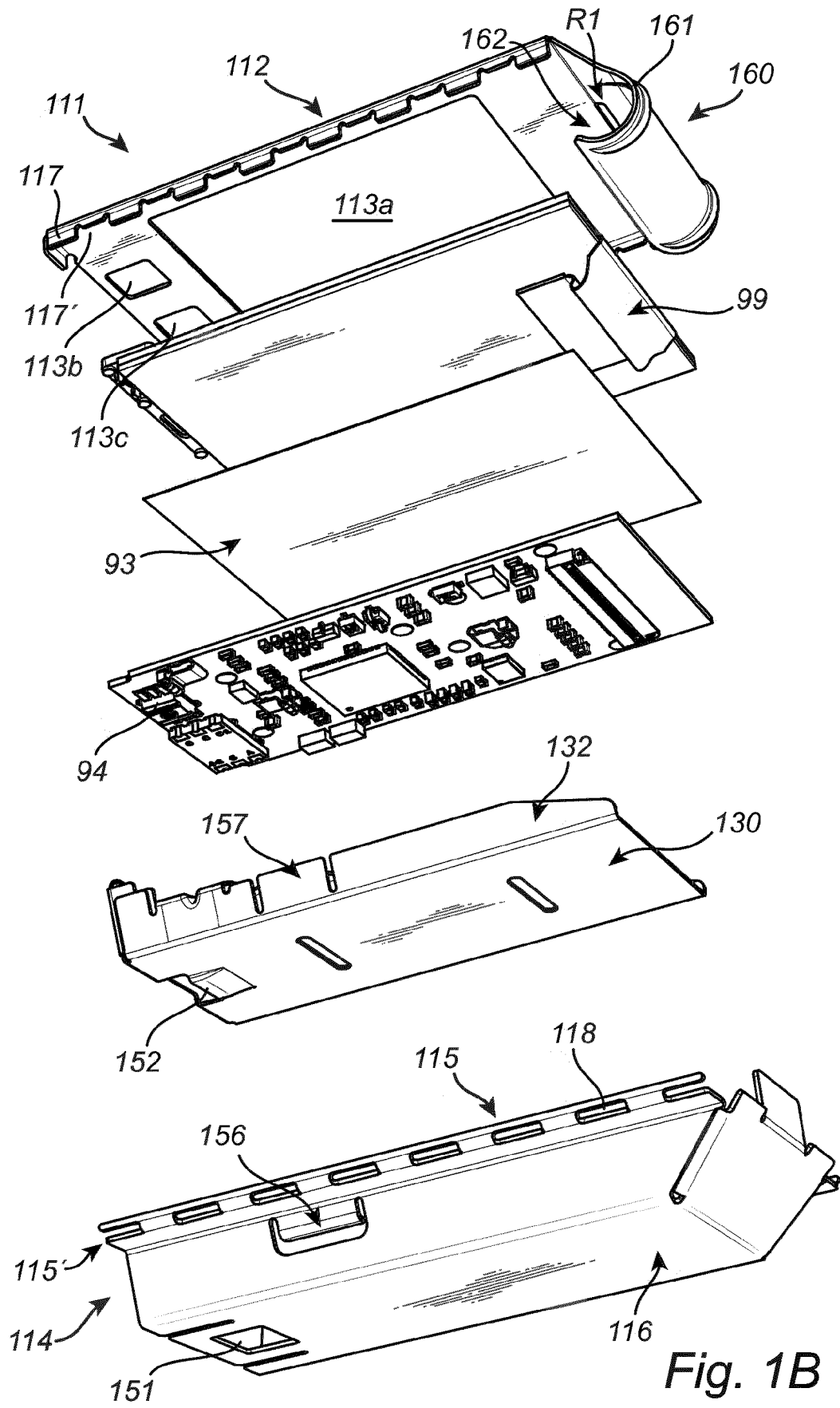


Fig. 1B

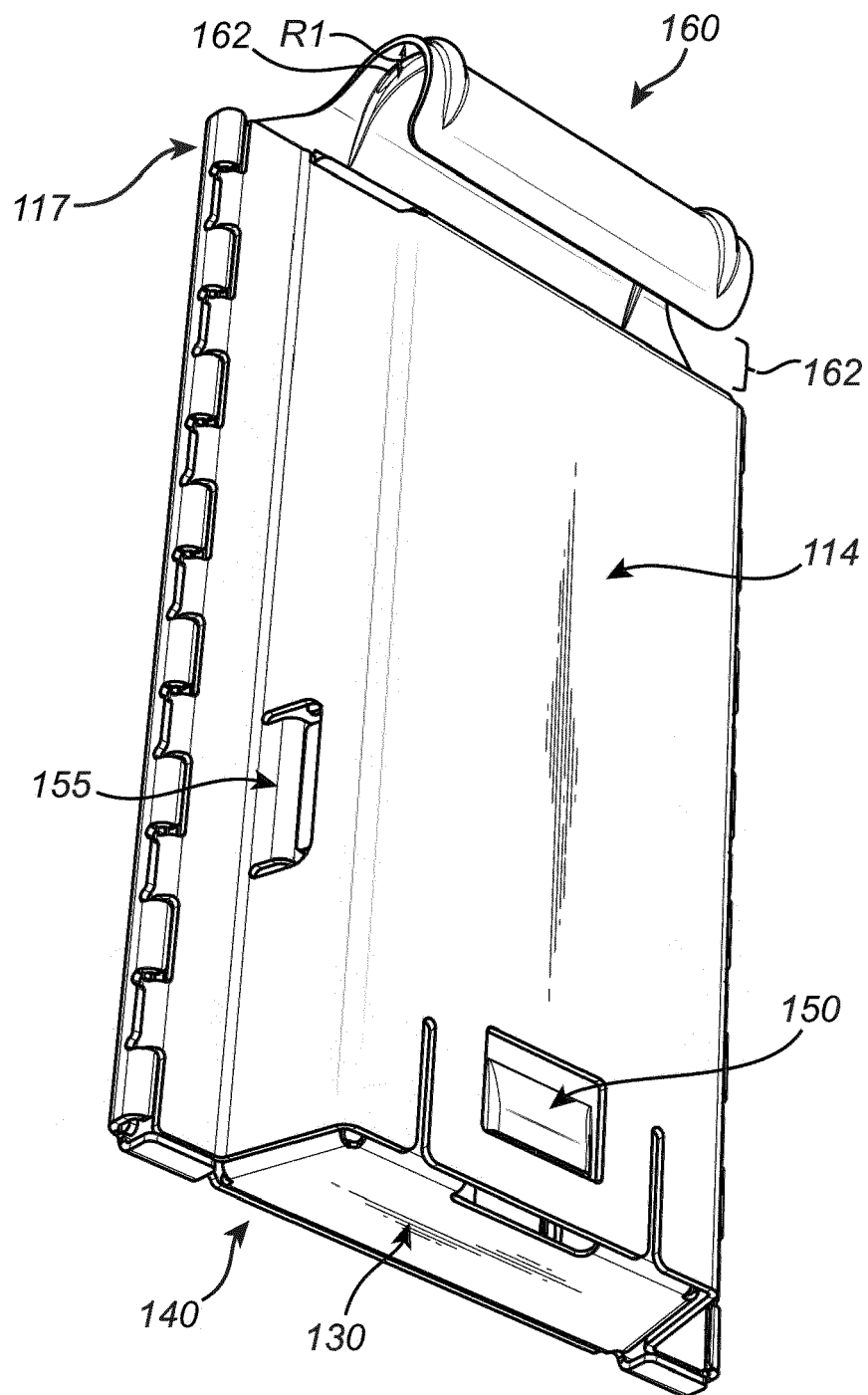
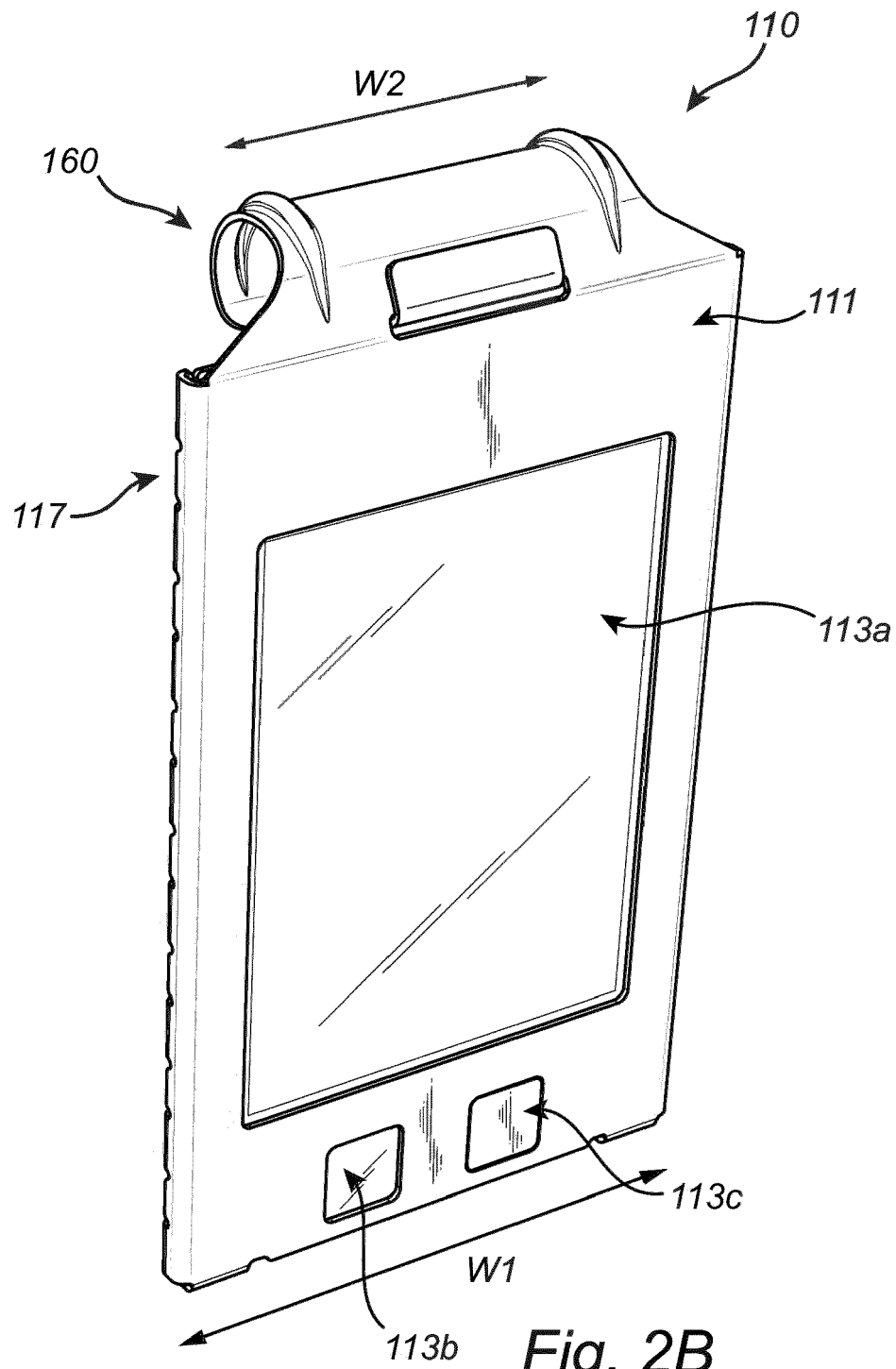


Fig. 2A





EUROPEAN SEARCH REPORT

Application Number

EP 23 15 8526

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EPO FORM 1503 03.82 (P04C01)

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Y	* abstract; figure 1- *	4, 5, 21, 22	
Y	----- US 2018/047310 A1 (TONEY CLARA [US] ET AL) 15 February 2018 (2018-02-15) * paragraph [0026] * * figures 1, 2 *	4, 5, 21, 22	
A	----- CN 105 005 810 A (SAMSUNG ELECTRO MECH) 28 October 2015 (2015-10-28) * abstract; figures 1, 2 *	1-22	
A	----- WO 2014/007737 A1 (PRICER AB [SE]) 9 January 2014 (2014-01-09) * page 7, line 19 - page 8, line 2 * * figures 1, 2 *	1-22	
			TECHNICAL FIELDS SEARCHED (IPC)
			G09F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 August 2023	Examiner Pantoja Conde, Ana
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

08-08-2023

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