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⑤④ **Assembly strip and rounded edges laminated case so built.**

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FR-A-1 424 379
FR-A-2 273 183

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Description

The present invention relates to an assembly strip in accordance with the pre-characterising part of claim 1. A plastic cabinet or case having rounded edges, particularly a piece of furniture in form of a closed web is obtained from this strip. The (open) cabinet so built as a closed web is adapted to house a TV receiver or to form the mainframe of a suspended cabinet.

It is known that cases for TV sets are built up by a closed web of wood or plastic material, veneered after assembling the case by a thin plastic sheet, and by two panels, respectively a front panel and a closing rear panel. A somewhat similar construction can be recognized also in suspended cabinets and the like. In the following reference will be made to a case for housing a TV receiver, but it is to be understood that the present invention also applies to other types of furniture.

The closed webs for TV receivers are usually built by injection molding a plastic material with the final volume of the TV case by the manufacturer whereas the assembly of the TV set is accomplished in the laboratories of other factories.

The main disadvantage of this technique derives from the size of the empty case that has to be shipped and stored. Although the cases are substantially empty they must be properly packed for shipment and exhibit a volume that is practically the same of the complete TV set even if the product is quite light and has a value extremely lower. This causes high costs for shipping, packing and storing the empty cases. In order to build TV cases there are also known closed webs obtained from wooden panels that are veneered and glued together, as well as from wooden panels glued to laminated plastic and suitably milled at the edges, the laminate being subsequently bent around the panels and secured by means of glue and reinforcement corners. Although such a construction achieves a substantial reduction of the size of the unassembled cabinet, it is quite laborious both for the manufacturer and the assembler of the case. In fact the wood and the inner panels have to be precisely milled without cutting the veneering to allow for the bending of the four sides and the final assembly requires reinforcement parts to be glued in order to strengthen the case. Moreover additional supports, connections and reference shoulders for securing the components (cathode ray tube, circuits, loudspeakers, knobs, etc.) have to be built on the wooden parts with additional costs and complications.

From FR—A—1 429 379 is known a substantially two-dimensional strip formed of at least three plastic panels caused to be mutually integral by means of a thin metal sheet which, upon manually bending at the corners, forms the outer housing of a case or cabinet. Such a strip however needs separate stiffening means to be fixed, e.g. glued to the cabinet walls and normally forms

squared edges in the bending zones, due to the metal sheet, whereas if round-shaped edges are preferred, as in TV-cases, it is necessary to adopt panels with special ribs at the ends. The features of the pre-characterising part of claim 1 are known from this document.

Joint means to keep contiguous panels at a given assembly angle is also known from FR—A—2 273 183, the panels being however separate and hinged to each other, without a common substrate, thus not having to resist an elastic return force.

The object of the present invention is to provide an assembly strip that is substantially two-dimensional and comprises at least three plastics panels placed one after another and spaced apart onto a single plastics laminate sheet; the strip being for producing when assembled a veneered case or cabinet with rounded corners, adjacent panels being at an angle to each other, without the drawbacks shown by the strips of the prior art.

According to the invention the strip is characterized in that the panels are provided at adjacent ends with joining means, these joining means comprising a pair of flat plastics tabs integrally formed with the panels; the respective plane of each tab being perpendicular to the plane of that panel on which the tab is provided and parallel to the length direction of the panel; each tab has a pin extending therefrom at right angles thereto and also has a hole; adjacent assembled panels being maintained at an angle to each other by temporarily elastically deforming the tabs until the pin and hole of one tab of the pair engage the hole and pin of the other tab and the tabs of the pair lie side by side.

The invention will now be disclosed with reference to some non limiting embodiments shown in the attached drawings in which:

FIGURE 1 is a perspective view of the flat strip of the invention incorporating three panels, also showing the fourth panel;

FIGURE 2 shows the assembled case that is turned down-side up for a better clearness;

FIGURES 3 to 5 show details of a preferred embodiment of the joint members; and

FIGURE 6 illustrates a detail of the case of Fig. 2.

With reference to Fig. 1 there is shown an assembly strip according to the invention that comprises a panel 2 adapted to form the horizontal upper side of the assembled case, two equal panels 3 and 4 forming the vertical side walls of the case, and a sheet of laminated plastic 1 connecting such elements. The panels are glued or anyhow attached to laminate 1, suitably spaced apart so that after turning by 90° the lateral panels the free portions of the laminate forms the re-curved or rounded edges 22 of the assembled case shown in Fig. 2.

According to the illustrated embodiment, bottom panel 5 of the case is built as a separate piece and is mounted at the end of the assembly. The above is not to be considered as a limitation to building a strip of laminated plastic incorporating all the four panels that constitute the TV case.

The reason of the choice depends on the size of the TV set. The linear envelope of a case for a 66 cm (26") TV case can bring about a notable difference of costs between an embodiment having three panels and the embodiment having four panels, particularly when the panels are to be directly molded over the laminate. For cases having a smaller size the difference of costs is reduced and it is preferable the embodiment carrying all the four panels applied onto the strip.

Returning now to the embodiment shown in Figs. 1 and 2, each panel 2, 3 and 4 is provided with at least a pair of longitudinal ribs 7, 7 having the purpose of strengthening the structure, and with at least a series of joint members 8, more clearly shown in Figs. 3 to 5. When the strip incorporates three panels it is preferred that the end portions 10 of the lateral panels have a recurved shape and are provided with suitable members for fastening panel 5 (see Fig. 6).

Panel 5 is provided with vent slots 15, as well as with all the other components required for the assembly of the complete TV set, such as spacers, sockets, recesses, reference shoulders, added materials, etc. All the above components are not shown in the figure for simplicity. However it is to be understood that the TV case can be built in such a way that almost every required component is mounted on panel 5 (cathode ray tube, circuits, etc.). This way the TV case can be partially assembled by bending and securing the three sides and then bottom panel 5 carrying all the required components can be mounted to complete the case, thereby making easier the assembly operation of the final product.

Figs. from 3 to 5 show a preferred embodiment of the joint members for securing together the parts. These members include flat tabs 23 rising from the panels and positioned slightly staggered. The shape of tabs 23 is substantially triangular with a rounded vertex 24, the radius being the same foreseen for the rounded edges of the assembled case. The curved end portion 28 of the panel extends for an arc of about 45° so as to evenly distribute the stresses on laminate 1 and matching the panels when the case is assembled. Tabs 23 opposing on two panels are staggered in order to position themselves side by side (Fig. 5) when the case is assembled. Each tab 23 carries a protruding pin 27 and a housing hole 26 having the same diameter. Pins and holes are properly positioned, e.g. as shown in Fig. 3, so as to engage with each other upon the rotation of a panel with respect to the other. The tabs are resilient enough to be deformed when the parts rotate due to the presence of the pins 27. After that the rotation is complete the pins are housed into the holes and the tabs elastically return to the original position as can be seen in Fig. 5. The cross-section of Fig. 4, along line S—S, shows how the end portions of the pins are tapered to make easier their introduction into holes 26. Fig. 1 shows four tabs on each adjacent edge of the panels, however the number of tabs can be increased or decreased as desired. As it is evi-

dent, the force required to elastically deform tabs 23 in the rotating step is quite modest and can be further reduced by suitable tapering and choice of the angles. On the contrary, once the parts are joined together, it would be necessary to act simultaneously on all the four pairs of tabs 23 diverting them in order to reopen the case to the flat configuration. Reinforcement ribs 29 and 30 staggered with respect to tabs 23 are provided to strengthen the structure opposing to fortuitous deformations. It is preferable to build ribs 29 and 30 as triangular ribs integral with the tabs. The latter in turn can be molded together with the panels or be mounted subsequently. The panels are of a plastic material such as shock resistant polystyrene and the covering or veneering sheet is a thermoplastic laminate, e.g. polystyrene. The outer surface of this laminate is already treated to obtain the desired finishing (imitating wood or metal etc.) for example by applying a heat transferable film. The case is assembled by rotating of 90° the lateral panels with respect to the inner one so as to bend the laminate over the corresponding curved portion of the panels that are then fastened into the final configuration by the joint members. Before accomplishing such operation a suitable glue or solvent can be advantageously spread on the surfaces of the joints, e.g. by spraying, and in case even on the inner surface of the laminate in order to obtain a better resistance of the assembled case. It is evident that the finishing of the case is much cheaper since it is accomplished in advance over a flat surface. Moreover the panels carry supports or references for the assembly of the parts forming the complete TV set such as loudspeakers, knobs, etc.

In Fig. 6 there is shown a detail of the end edges 10 of the strip. They are provided with a guide groove 42 into which the end profile 40 of panel 5 slides. Flat tabs 43 can be provided in this area too, only having a support function.

There are possible several processes to apply the panels onto the flat sheet of plastic laminate. Panels can be molded and secured to the laminate in a centering frame by glueing or by ultrasonic bonding. As an alternative the sheet of finished laminate can be placed at the bottom of an injection mold wherein by press molding the panels are formed, simultaneously with a local fusion of the two elements (laminate and granulates injected). Finally the sheet of laminate can be coupled to the panels into an extruding machine for plastic granulates having the profile of the panel cross section and in this case a further milling operation is required to remove the portions below the molded edges of the case without cutting the thickness of the laminate.

Claims

1. An assembly strip that is substantially two-dimensional and comprises at least three plastics panels (2, 3, 4) placed one after another and spaced apart onto a single plastics laminate sheet (1); the strip being for producing when assembled

a veneered case or cabinet with rounded corners adjacent panels being at an angle to each other; characterized in that:

(i) the panels are provided at adjacent ends with joining means, these joining means comprising a pair of flat plastics tabs (23) integrally formed with the panels;

(ii) the respective plane of each tab being perpendicular to the plane of the panel on which the tab is provided and parallel to the length direction of the panel;

(iii) each tab has a pin (27) extending therefrom at right angles thereto and also has a hole (26);

(iv) adjacent assembled panels being maintained at an angle to each other by temporarily elastically deforming the tabs until the pin and hole of one tab of the pair engage the hole and pin of the other tab and the tabs of the pair lie side by side.

2. An assembly strip as claimed in claim 1, characterized in that said tabs (23) are equally spaced apart on the panels, and are provided with at least a reinforcing side rib (29, 30) on the side opposed to the one carrying the pin.

3. An assembly strip as claimed in claim 1, incorporating three panels, characterized in that the end edges of the panels (3, 4) are provided with guide profiles or grooves (42) for the introduction of a further panel (5) to form the bottom of the case.

4. A rounded edge case in form of a closed web, particularly a case for enclosing a television receiver, build from an assembly strip according to any preceding claim characterized in that said panels (2, 3, 4) are provided with longitudinal reinforcing ribs (7, 7) and with supports for securing the several components of the complete television receiver, and in that the outer surface of the sheet of plastic laminate (1) is covered by a finishing film.

5. A case as claimed in claim 4, characterized in that said sheet of plastic laminate (1) is secured to said panels (2, 3, 4) by glueing.

6. A case as claimed in claim 4, characterized in that said sheet of plastic laminate (1) is secured to the panels (2, 3, 4) when forming them in a injection mold, said sheet of plastic laminate being placed at the bottom of the mold and being partially melt on its inner surface during the molding of the panels.

7. A case as claimed in claim 4, characterized in that said strip is formed by coupling the sheet of plastic laminate to an extruding machine producing a continuous panel and that said continuous panel is subsequently milled to form the discrete panels spaced apart onto the strip.

Revendications

1. Profilé d'assemblage essentiellement a deux dimensions comprenant au moins trois panneaux en matière plastique (2, 3, 4) disposés les uns adjacents aux autres avec des écarts entre eux sur une feuille en laminé plastique (1) à utiliser pour fabriquer — après assemblage — un coffret ou

meuble plaqué à coins arrondis dans lequel les panneaux adjacents forment un angle entre eux, caractérisé en ce que:

(i) sur les panneaux — aux extrémités adjacentes — ils sont prévus des moyens de jonction, lesquels moyens de jonction sont constitués par des couples de ressauts plats en plastique (23) et sont obtenus de façon intégrale avec les panneaux;

(ii) les plans respectifs de chaque ressaut sont perpendiculaires au plan du panneau sur lequel il est prévu le ressaut, et parallèles à la direction longitudinale du panneau;

(iii) sur chaque ressaut il est prévu une goupille (27), saillant à son tour à angle droit par rapport au ressaut, et un trou (26);

(iv) les panneaux adjacents assemblés sont tenus dans une telle position l'un par rapport à l'autre qu'ils forment entre eux un angle en imposant une déformation élastique temporaire aux ressauts jusqu'à ce que la goupille et le trou de l'un des ressauts du couple s'engagent avec le trou et la goupille de l'autre ressaut et les deux ressauts du couple vont se trouver l'un à côté de l'autre.

2. Profilé d'assemblage selon la revendication 1, caractérisé en ce que lesdits ressauts (23) sont espacés sur le panneau de façon à être équidistants entre eux et sont munis d'au moins une nervure latérale de renforcement (29, 30) du côté opposé à celui qui porte la goupille.

3. Profilé d'assemblage selon la revendication 1 incorporant trois panneaux, caractérisé en ce que les bords terminaux des panneaux (3, 4) sont munis de profils ou rainures de guidage (42) pour l'introduction d'un autre panneau (5) qui doit former le fond du coffret.

4. Coffret à coins arrondis ayant la forme d'une bande continue, en particulier coffret destiné à contenir un récepteur de télévision, fabriqué à partir d'un profilé d'assemblage selon l'une n'importe quelle des revendications précédentes, caractérisé en ce que lesdits panneaux (2, 3, 4) sont munis de nervures longitudinales de renforcement (7, 7) et de supports pour y fixer les divers composants du récepteur de télévision complet, et en ce que la surface extérieure de la feuille en laminé plastique (1) est revêtue par une pellicule de finissage.

5. Coffret selon la revendication 4, caractérisé en ce que ladite feuille en laminé plastique (1) est fixée auxdits panneaux (2, 3, 4) par collage.

6. Coffret selon la revendication 4, caractérisé en ce que ladite feuille en laminé plastique (1) est fixée auxdits panneaux (2, 3, 4) au moment de leur formation par moulage par injection, où ladite feuille en laminé plastique est placée sur le fond de la moule et coule partiellement à sa surface intérieure au cours du moulage des panneaux.

7. Coffret selon la revendication 4, caractérisé en ce que ledit trait est formé en accouplant la feuille en laminé plastique à une machine à extruder qui fabrique un panneau continu et que ledit panneau continu est successivement fraisé à

former les panneaux discrets écartés sur le profilé.

Patentansprüche

1. Verbindungstreifen, der wesentlich zweidimensional ist, und aus mindestens drei Kunststoffbretter (2, 3, 4) besteht, die nebeneinander auf eine einzelne Kunststoffschichtplatte (1) im Abstand angebracht sind, um — wenn zusammengestellt — ein furniertes Gehäuse mit abgerundeten Ecken herzustellen, worin die nebeneinanderliegende Schichtplatten im Winkel angeordnet sind, dadurch gekennzeichnet, dass:

(i) die Schichtplatten sind an den jeweils nebeneinanderliegenden Enden mit Verbindungsmitteln versehen, welche aus einem Paar flache Vorsprünge (23) bestehen, die mit den Schichtplatten einheitlich sind und aus Kunststoff bestehen;

(ii) die jeweilige Ebene jedes Vorsprunges senkrecht zur Ebene der jeweiligen Schichtplatte, worauf der Vorsprung sich befindet, und parallel zur Längsrichtung derselben ist;

(iii) jeder Vorsprung einen Stift (27) trägt, der im rechten Winkel vomselben hervorspringt, und auch ein Loch (26) aufweist;

(iv) die nebeneinanderliegend zusammengestellte Schichtplatten im Winkel gegeneinander gehalten werden durch vorläufige Verformung der jeweiligen Vorsprünge bis der Stift bzw. das Loch eines Vorsprunges des jeweiligen Paares und das Loch bzw. der Stift des entsprechenden Vorsprunges des Paares ineinandereingreifen und beide Vorsprünge des Paares nebeneinanderliegen.

2. Verbindungstreifen nach Anspruch 1, dadurch gekennzeichnet, daß die obengenannte Vorsprünge (23) in gleichem Abstand voneinander auf der jeweiligen Schichtplatte angeordnet und mit wenigstens einer Verstärkungsseitenrippe (29, 30) auf der Seite versehen sind, die

derjenigen die den Stift trägt gegenüberliegend ist.

3. Verbindungstreifen nach Anspruch 1, die drei Schichtplatten enthält, dadurch gekennzeichnet, daß die Endkanten der Schichtplatten (3, 4) mit Leitprofilen bzw. -rillen (42) versehen sind, die zur Einführung einer weiteren Schichtplatte (5) dienen, die den Boden des obengenannten Gehäuses bildet.

4. Gehäuse mit abgerundeten Ecken als endloses Band ausgebildet, insbesondere Gehäuse zum Aufnehmen eines Fernsehempfängers, das aus einem Verbindungstreifen nach einem der obigen Ansprüche hergestellt worden ist, dadurch gekennzeichnet, daß die obengenannte Schichtplatten (2, 3, 4) mit in der Längsrichtung gerichteten Verstärkungsrippen (7, 7) und Tragstützen versehen sind, welche Tragstütze zum Befestigen der verschiedenen Bestandteile des fertigen Fernsehempfängers dienen, und daß die Außenfläche der Kunststoffschichtplatte (1) mit einem Finishfilm beschichtet ist.

5. Gehäuse nach Anspruch 4, dadurch gekennzeichnet, daß die obengenannte Kunststoffschichtplatte (1) auf die obengenannte Bretter (2, 3, 4) durch Leimung befestigt ist.

6. Gehäuse nach Anspruch 4, dadurch gekennzeichnet, daß die obengenannte Kunststoffschichtplatte (1) auf die Bretter (2, 3, 4) befestigt wird beim Formen derselben durch Spritzgießen, wobei die obengenannte Kunststoffschichtplatte auf dem Boden der Spritzgießform liegt und auf ihrer Innenfläche teilweise geschmolzen wird während die Bretter geformt werden.

7. Gehäuse nach Anspruch 4, dadurch gekennzeichnet, daß der obengenannte Verbindungstreifen dadurch gebildet wird, daß die Kunststoffschichtplatte mit einem Extruder gekuppelt wird, der ein endloses Brett herstellt und daß das obige endloses Brett anschließend zu einzelnen, im Abstand auf dem Streifen angeordneten Bretter fräsiert wird.

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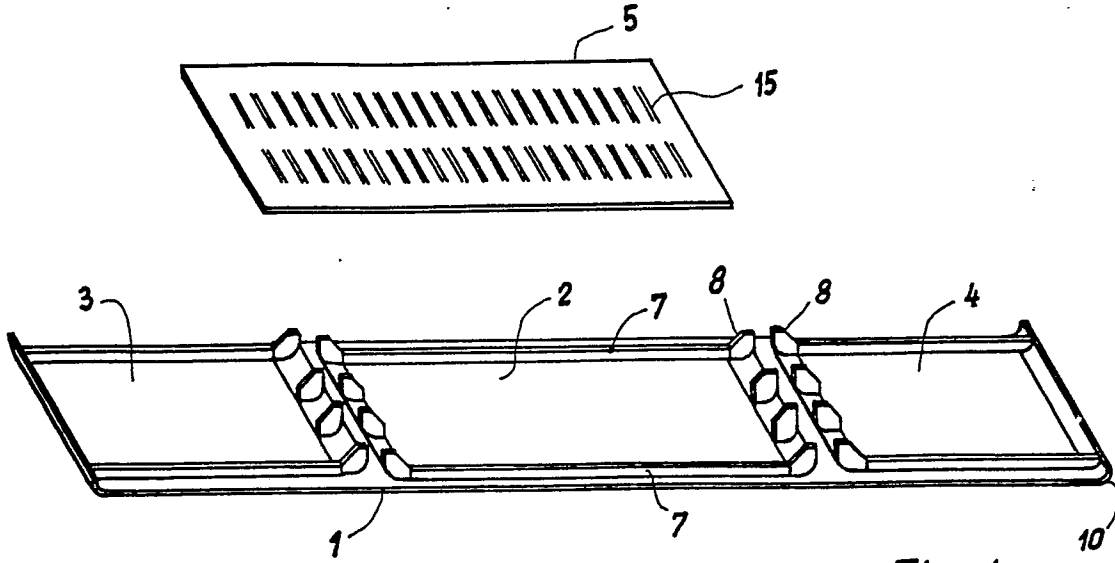


Fig. 1

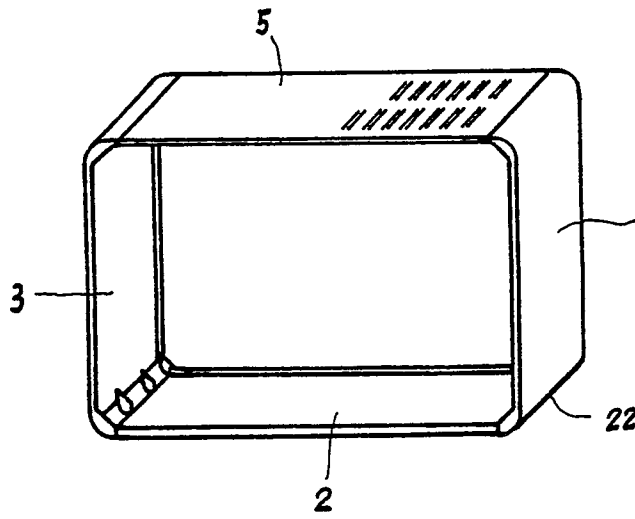


Fig. 2

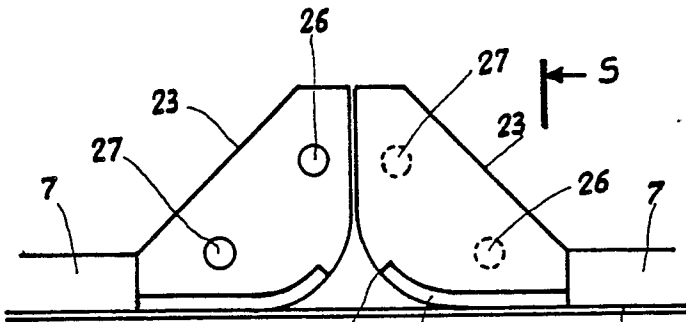


Fig. 3

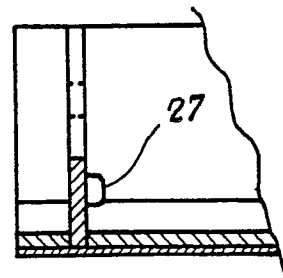


Fig. 4

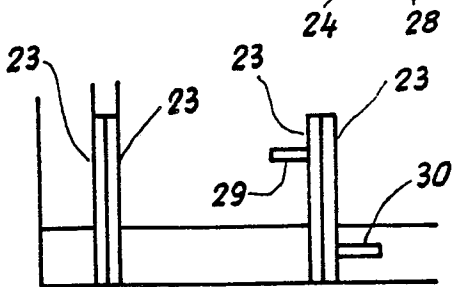


Fig. 5

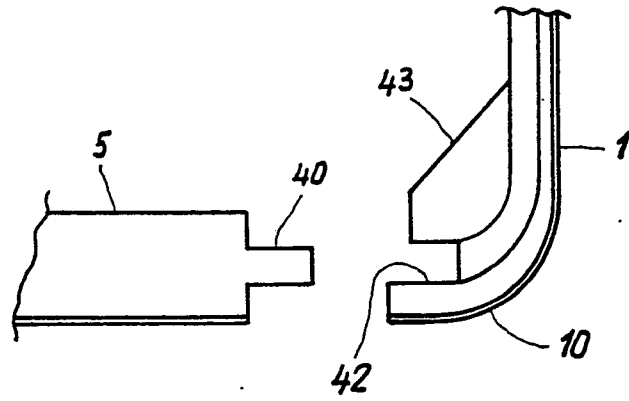


Fig. 6

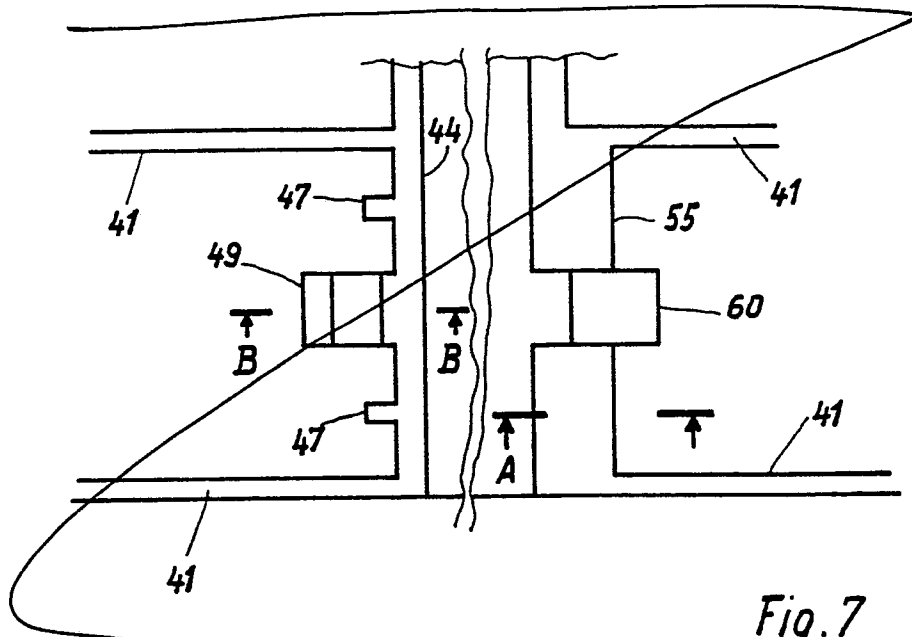


Fig. 7

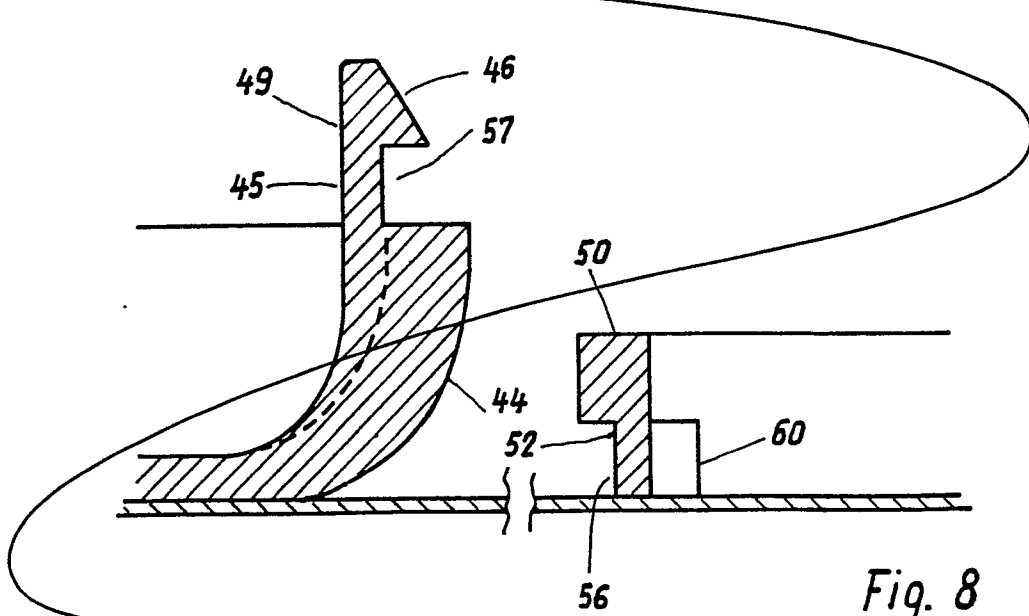


Fig. 8