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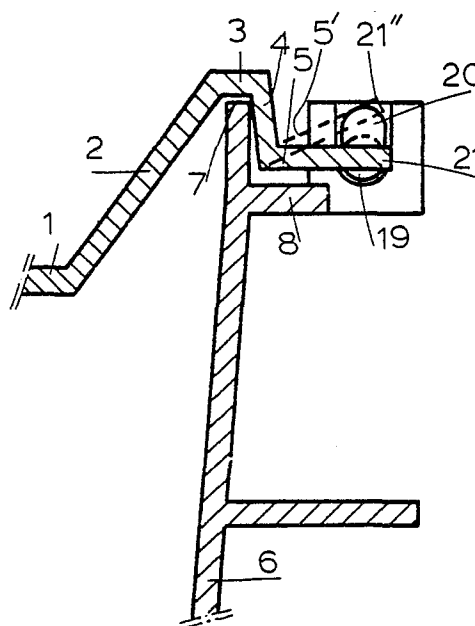
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⑤④ **Plastic container with hinged plastic lid.**

⑤⑦ Plastic container (6) with lid (1) connected to the container (6) by means of a hinge bearing (9) with pin (19). Pilferage can be detected by that the hinge pin (19) can not be removed without damaging a tooth (21) which locks the hinge pin (19) when the container (6) and lid (1) are in closed position.



PLASTIC CONTAINER WITH HINGED PLASTIC LID

The invention relates to a container with a lid, both injection-moulded from plastic, comprising a lid with one or more hinge bearings moulded integral with the lid, a container with one or more hinge bearings moulded integral with the container which have been provided on a horizontal rib on the outside of the container at some distance below or at the upper rim of the container, and a hinge pin taken through channels in the hinge bearings.

A similar container and lid are known from Dutch Patent Application No. 7903472. This type of container is often used for the transport of goods of high market value. To this end, the lid is sealed, so that pilferage can be detected. The disadvantage of this and other containers is that when the container is closed the hinge pin can easily be removed and replaced without this being noticeably by the receiver of the container.

It is the aim of the invention to obviate this defect.

This is achieved by the bottoms of the aligned channels for the hinge pin being completely outside the horizontal rib and these channels with their bottoms virtually touching the plane through the top of the horizontal rib, by the hinge pin having a head comprising an end portion of the pin, bent back at a right angle, which head lies sunk in a locking recess at the top of a hinge bearing of the container and by the lid, viewed in closed position, having a sideways projecting locking tooth, which is situated in a direct line with and virtually against the head portion of the hinge pin, and which is of such flexibility that it can without damage be brought outside the cross section of the hinge pin by bending it upwards but will be permanently damaged if it is bent further to above the head of the hinge pin.

A container and hinged lid made thus according to the invention cannot be opened by removal of the hinge pin without damage to the locking tooth or teeth. When the container is closed, the locking tooth is prevented from being bent downward to outside the cross section of the hinge pin by the base of the tooth almost immediately hitting the top of the horizontal rib. When it is attempted to bend the locking

tooth upward to above the head of the hinge pin, the locking tooth is damaged. Since this damage consists in tearing, breaking or permanent deformation, it is visually perceptible.

The invention will now be elucidated with reference to an embodiment of the invention shown in the drawing.

- 5           In the drawing,  
Fig. 1     is a top elevation of a hinge part of a container and lid according to the invention;  
Fig. 2     is a front elevation of the part shown in Fig. 1;  
Fig. 3     is a front elevation of a hinge pin with head according  
10           to the invention;  
Fig. 4     is a left side elevation of the hinge pin with head according to Fig. 3;  
Fig. 5     is a right side elevation of the hinge pin with head according to Fig. 3;  
15   Fig. 6 to 13 inclusive are cross sections along the lines VI-VI, VII-VII, VIII-VIII, IX-IX, X-X, XI-XI, XII-XII, XIII-XIII respectively in Fig. 1, on a larger scale, and  
Fig. 14    is a cross section of a container with an open downwardly hanging lid, drawn on the basis of the closed position in  
20           Fig. 13.

In the top elevation in Fig. 1 and in the cross section in Fig. 6, 1 is a sunk middle part, 2 is an upward slanting part, 3 is a rim part, 4 is a downward-hanging, rim part and 5 is a side flange of a plastic lid which is in closed position on a plastic container with an  
25   upricht wall 6 which on its outside, at some distance from its upper rim 7, has a horizontal rib 8. This rib can also join the upper rim to form an outwardly extending flange of the container. The lid and the container have been drawn only in part in the figures. From figures 1, 2, 10, 11 and 12 it is clear that the lid has a hinge bearing 9 moulded  
30   integral with its side flange 5 and downward-hanging rim part 4. This hinge bearing is on both ends connected with the downward-hanging rim part 4 by upward-sloping ridges 10 and in between the ridges by the side flange 5, see Fig. 12. The slots 11 in the ridges 10 (see Fig. 11) and the slot 11' in the section between the ridges 10 (see fig. 12) in  
35   longitudinal direction define, as it were, a round channel 12 through which a hinge pin 13 can be taken. Figures 1, 2, 7, 8 and 9 show that

the container has hinge bearings 14 moulded integral with its horizontal rib 8, with recesses 15 at the top of the ends of the hinge bearings. These hinge bearings further have a recess 16 at their top and recesses 17 and 18 at their vertical outer side. See Figures 1 and 2. The cross section of recesses 16 and 18 have the same aspect as the cross sections of recesses 15 and 17 respectively, which have been drawn in Figures 8 and 9 respectively. In the longitudinal direction of the hinge bearing, the slots 15, 16, 17 and 18 define, as it were, a round channel 12' through which the hinge pin 13 can be taken. The part of recess 15 situated above the round channel 12' forms a locking recess 15' to fit the head 20 of the hinge pin, which is discussed below. The aligned channels 12 and 12' of hinge bearings 9 and 14 respectively touch plane A through the top of the horizontal rib with their bottoms. Plane A is indicated in Figs. 7 and 10. Otherwise, these channels 12 and 12' are completely outside the horizontal rib 8, viewed in horizontal direction.

Figures 3, 4 and 5 show a front elevation, a left side elevation and a right side elevation of a hinge pin 13 with at its end 19 a head 20 at a right angle with the pin. When mounted, the pin 13 is in the round channels 12, 12' and the head 20 is sunk in the above-mentioned locking recess 15' at the top of hinge bearing 14, which is indicated in Figures 1, 6, 7 and 8. This means that the head 20 is fixed in upright position. It is also clear that the pin does not rotate when the lid is opened or closed. Because of the presence of the slots and recesses, the condition of a large part of the hinge can be checked visually.

In order to make it possible to ascertain whether the pin of a sealed closed container has been removed temporarily from the hinge bearings, the lid is provided with locking teeth. These locking teeth have been indicated with 21 in the figures. In this case, where the lid has a side flange 5, they consist of local widenings of this side flange. The base of the locking tooth is integral with the side flange. The locking teeth have been provided in such a way that they can lie in a direct line with and virtually against the head of the hinge pin, as follows from Figures 1, 2, 6, 13 and 14.

In Fig. 14, the lid is shown after it has been brought from the closed position in Fig. 13 to the downwardly hanging position. With the lid in this first position, the headed hinge pins are mounted. To

this end the locking teeth possess a flexibility which makes it possible to bend them to outside the cross section of the hinge pin 13 as indicated by the interrupted line 21' in Fig. 14. In this position 21' of the locking tooth, the hinge pin can be brought into the channel 12, 12', and the head into the locking recess 15', after which the locking  
5 tooth springs back to its original position. In the closed position as shown in Figure 13, the hinge pin and head cannot be removed without damage to the locking tooth. This is because the locking tooth can be bent to position 21'' (see Fig. 13) but will be damaged if it is bent further to above the head 20 of the hinge pin. Downward bending of the  
10 locking tooth is limited because the side flange 5 with which the base of the locking tooth is integral almost immediately hits the horizontal rib 8. Thus, at least part of the tooth remains in a direct line with the hinge pin, so that the latter cannot be removed.

Although two locking teeth have been drawn in Figs. 1 and 2,  
15 one locking tooth per hinge pin suffices for the intended effect.

The hinge pin can be made of plastic.

A container and lid can be provided with more than one hinge assembly.

The flexibility of the locking teeth depends on the nature of  
20 the material they consist of and on their dimensions. This should be taken into account during the design of the teeth, in order to achieve the desired flexibility. Therefore the container and the lid may be made of different plastics.

1. Container with a lid, both injection-moulded from plastic, comprising  
a lid with one or more hinge bearings moulded integral with the lid,  
a container with one or more hinge bearings moulded integral with the  
container which have been provided on a horizontal rib on the outside  
of the container at some distance below or at the upper rim of the  
5 container, and a hinge pin taken through channels in the hinge  
bearings, characterized in that the aligned channels for the hinge  
pin are completely outside the horizontal rib and these channels with  
their bottoms virtually touch the plane through the top of the hori-  
zontal rib, in that the hinge pin has a head comprising an end  
10 portion of the pin bent back at a right angle, which head lies sunk  
in a locking recess at the top of a hinge bearing of the container  
and in that the lid, viewed in closed position, has a sideways pro-  
jecting locking tooth which is situated in a direct line with and  
virtually against the head portion of the hinge pin and which is of  
15 such flexibility that it can without damage be brought outside the  
cross section of the hinge pin by bending it upwards, but will be  
permanently damaged if it is bent further to above the head of the  
hinge pin.
2. Container with a lid according to claim 1, characterized in that the  
20 locking tooth is formed by a local widening of a horizontal side  
flange of the lid.
3. Container with a lid according to claim 1 or 2, characterized in that  
for every hinge pin there is one locking tooth.
4. Container with a lid according to any one of the claims 1-3, charac-  
25 terized in that the walls of the hinge bearings are not quite closed.
5. Container with a lid according to any one of the claims 1-4, charac-  
terized in that the container and its lid are made of different  
plastics.

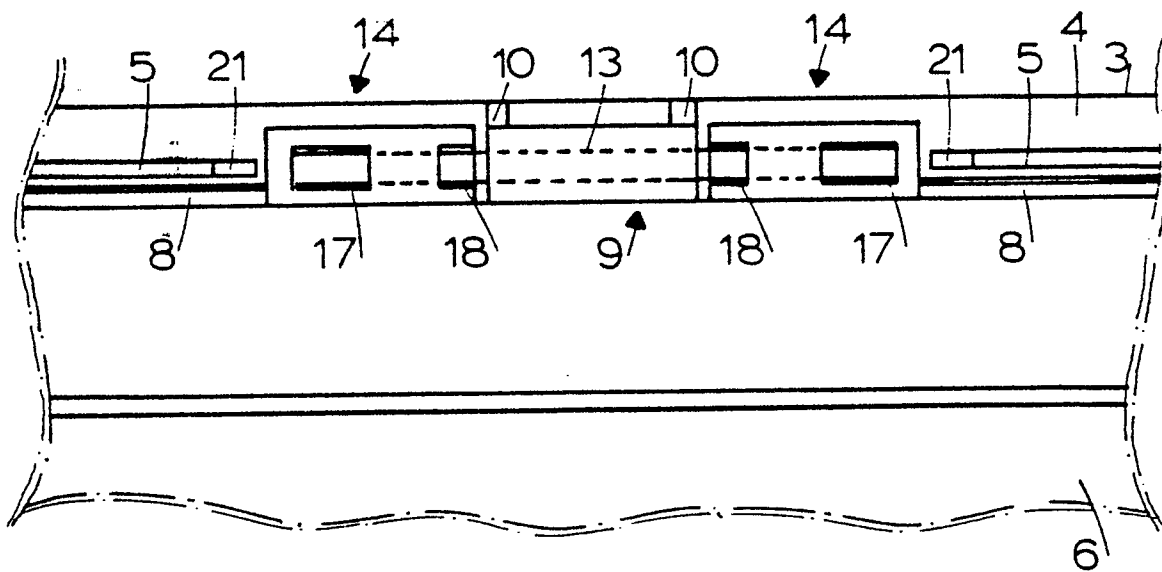
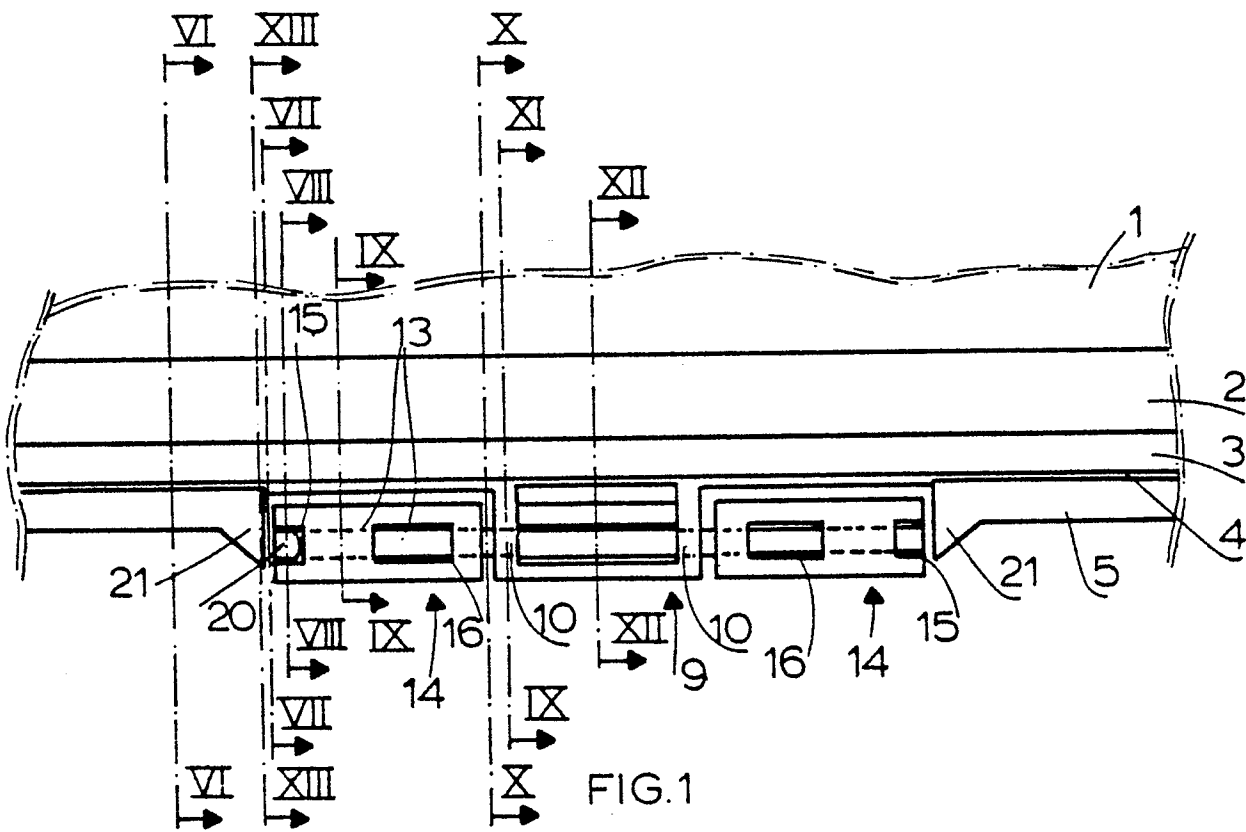


FIG. 2

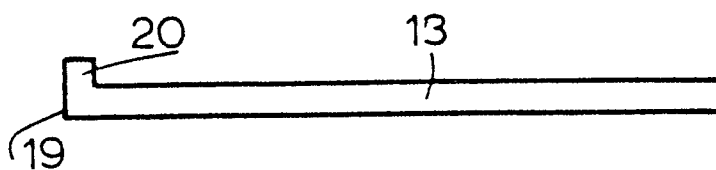
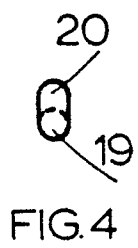


FIG. 3



FIG. 5

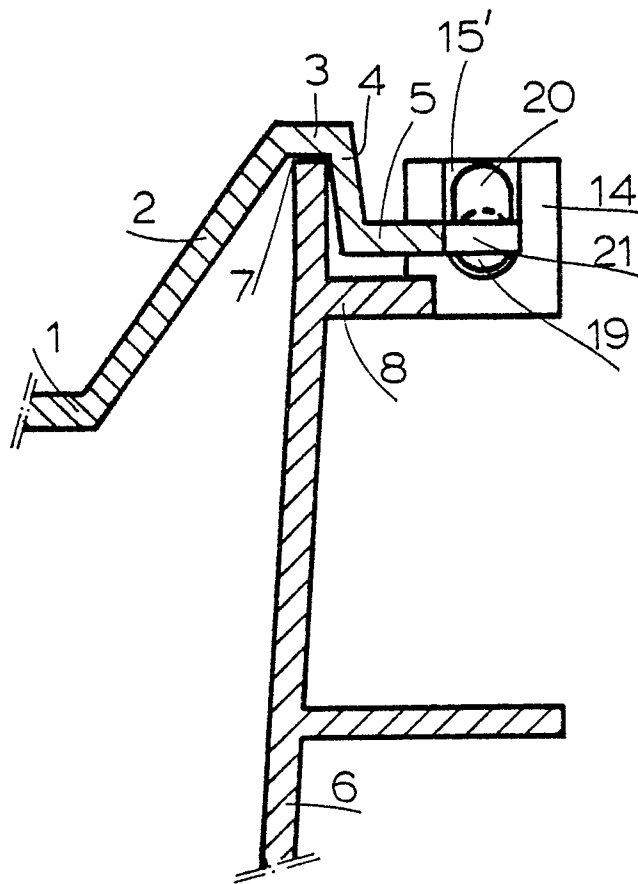


FIG. 6

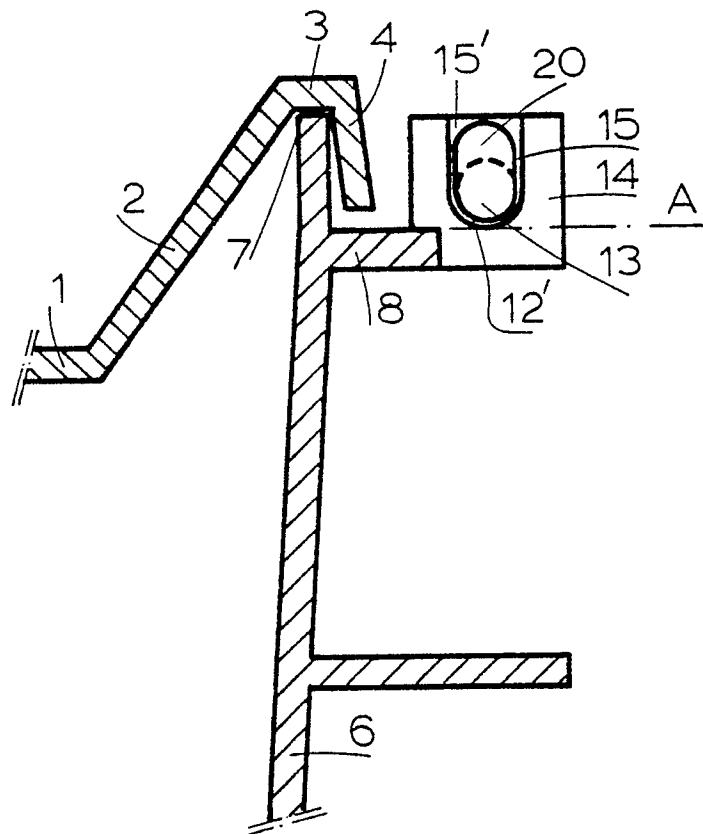


FIG. 7



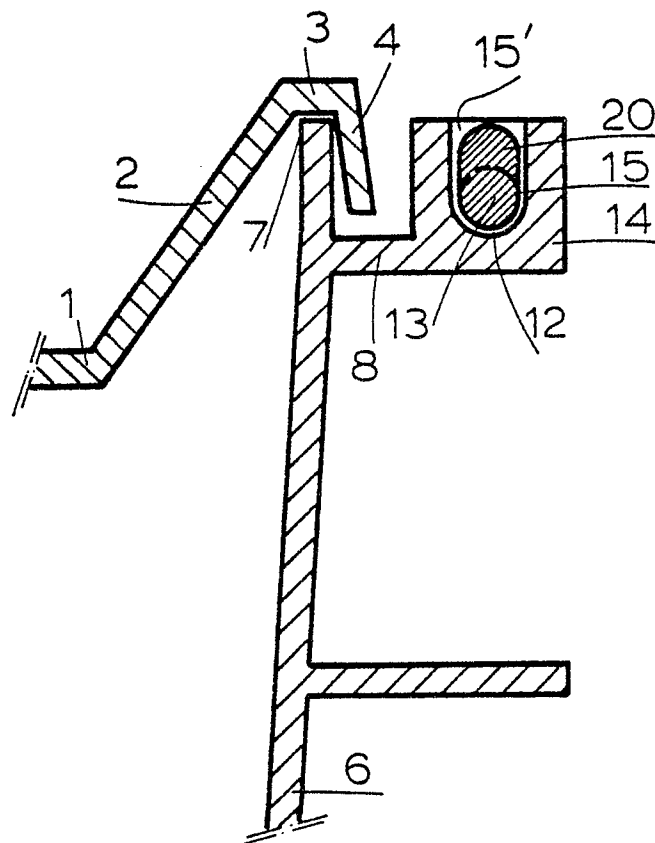


FIG. 8

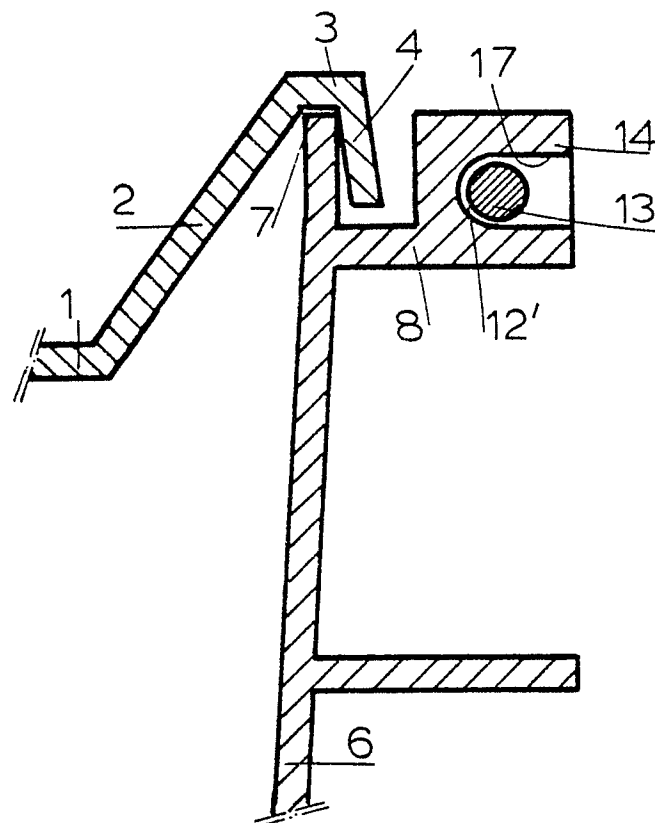


FIG. 9

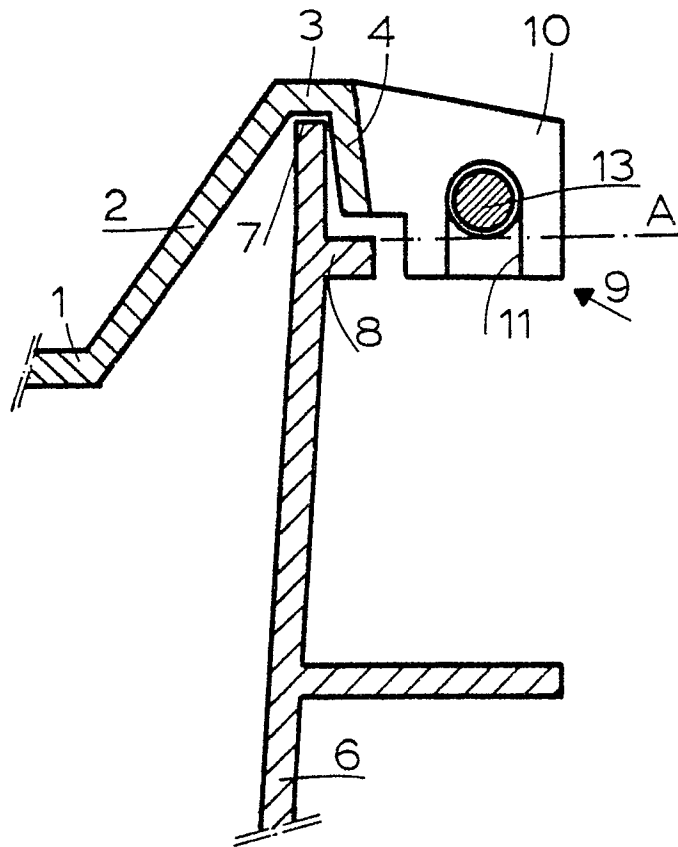


FIG. 10

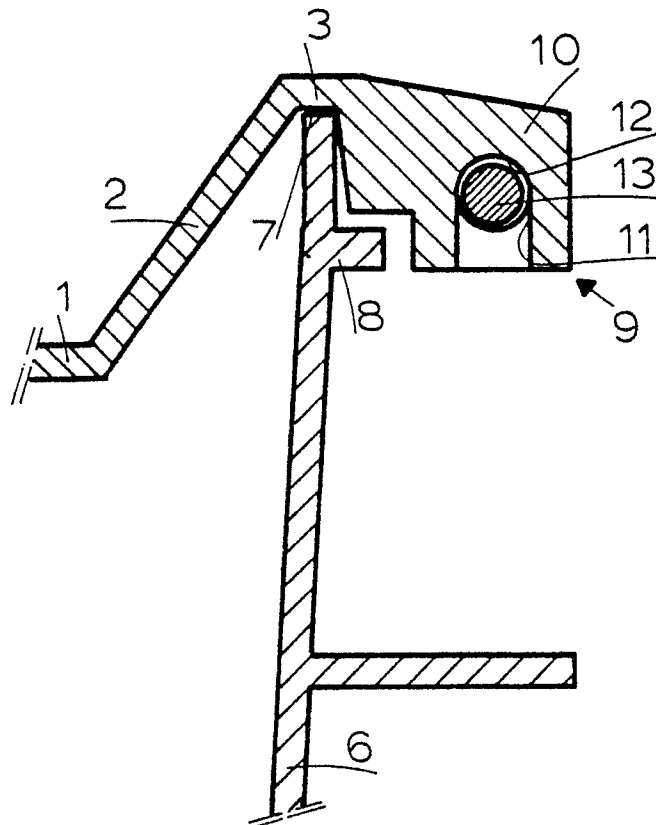
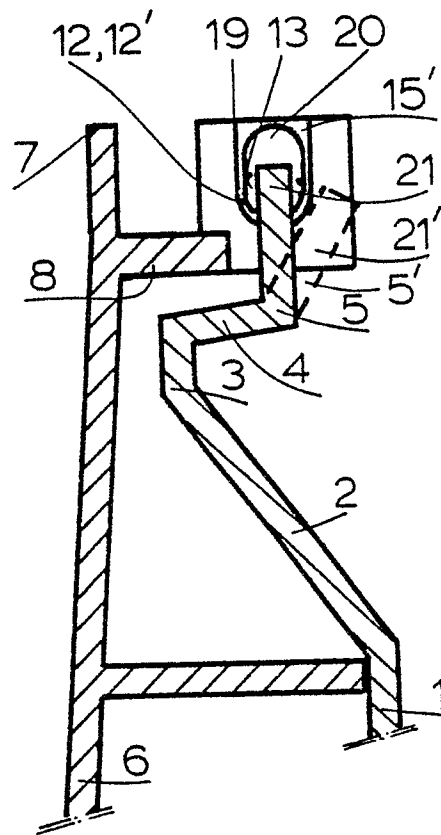


FIG. 11







European Patent  
Office

# EUROPEAN SEARCH REPORT

0070611

Application number

EP 82 20 0927

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
A,D	--- NL-A-7 903 472 (CURVER B.V.) * Whole document *	1	B 65 D 43/16
A	--- US-A-4 161 261 (MENASHA CORP.) * Whole document *	1	
A	--- US-A-2 766 901 (MOTOROLA INC.) * Whole document *	1	
A	--- US-A-2 998 898 (GENERAL ELECTRIC COMP.) * Column 2, lines 3-46; figures 2,3 *	1	
A	--- FR-A-1 089 043 (HENSEL) * Page 1; right-hand column, lines 28-34; figures 1,3,4 *	1	
A	--- US-A-2 093 926 (UNION STEEL CHEST CORP.) * Whole document *	1	B 65 D E 05 D
A	--- GB-A- 357 894 (SEMRAD) * Page 1, lines 87-98; figures 10,11 *	1	
A	--- US-A-2 762 076 (CONTINENTAL PLASTICS CORP.) * Column 2, lines 3-54; figures *	1,4	
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25-10-1982	Examiner BAERT F.G.
<b>CATEGORY OF CITED DOCUMENTS</b>			
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	