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(54) **Overhead baggage rack unit of railway car**

(57) The invention provides an improved overhead baggage rack for a railway car. An overhead baggage rack unit (50) provided at a shoulder portion between a side frame (10) and a roof frame (20) of a railway car comprises an overhead baggage rack body (100) and a pole (200). The overhead baggage rack body (100) comprises a front edge portion (110), a rear edge portion (112) and a transverse member (114) formed by mechanically cutting out portions from an extruded aluminum alloy member, and thereby, an opening (130) is formed to which an overhead baggage rack panel is attached. A grip bar (150) is cut and formed to an area lower than the front edge portion (110). The front edge portion (110) is fixed via a bracket (160) to the pole (200).

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Description

BACKGROUND OF THE INVENTION

5 Field of the invention

[0001] The present invention relates to an overhead baggage rack unit provided on a railway car or the like (such as a train or a monorail car).

10 Description of the related art

[0002] The railway car is composed of an underframe constituting a floor member of the car, a side frame, a roof frame and so on.

15 **[0003]** In a commuter train and the like, a long sheet is disposed along the longitudinal direction of the vehicle, and an overhead baggage rack is provided at the overhead area of the long sheet.

[0004] As disclosed in Japanese Patent Application Laid-Open Publication No. 11-222125 (patent document 1), luggages of passengers are placed on the overhead baggage rack, but according to the prior art car structure, the overhead baggage rack is fixed to the side ceiling or the side frame in order to support the weight of luggages, and the front edge portion of the overhead baggage rack is connected to a wing partition or a pole.

20 **[0005]** According to the above structure, the overhead baggage rack which is a single member is attached to more than two separate structural members such as the side ceiling and the wing partition. Thus, it is necessary to adjust the mounting brackets and the like to correspond to the tolerance or the strain of the members.

[0006] Moreover, the overhead baggage rack is required to be light weight and cost effective, but the prior art overhead baggage rack was formed of metal plates and nets, which were neither light weight nor cost effective.

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SUMMARY OF THE INVENTION

[0007] Therefore, the object of the present invention is to provide a light weight, cost-effective overhead baggage rack body.

30 **[0008]** The present invention provides an overhead baggage rack body constituting the overhead baggage rack unit formed by cutting an extruded aluminum alloy material e.g. by machining, having an opening between a front edge portion and a rear edge portion; a transverse member connecting the front edge portion and the rear edge portion; and an overhead baggage rack mounted on the opening.

35 **[0009]** The overhead baggage rack body constituting the overhead baggage rack unit is formed by cutting a material formed by extruding aluminum alloy. The overhead baggage rack body is long and disposed along the side frame in the width direction of the railway car, and since the body is formed by cutting an extruded shape member, the formed overhead baggage rack body can be light weight and formed in a cost-effective manner.

[0010] Further, a grip bar is disposed in parallel along the front edge portion, which can be formed from the same extruded shape member, so it is formed in a cost-effective manner.

40 **[0011]** Furthermore, the grip bar is fixed via a bracket to a pole for supporting the overhead baggage rack.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

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FIG. 1 is an explanatory view showing the arrangement of a overhead baggage rack unit according to the present invention;

FIG. 2 is an explanatory view of the overhead baggage rack body;

FIG. 3 is an explanatory view of the overhead baggage rack body;

50 FIG. 4 is a view taken at arrow A-A of FIG. 3;

FIG. 5 is a view taken at arrow B-B of FIG. 3;

FIG. 6 is a view taken at arrow C-C of FIG. 3; and

FIG. 7 is an explanatory view showing a method for processing of the present overhead baggage rack body.

55 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] FIG. 1 is a perspective view showing the general structure of an overhead baggage rack unit according to the present invention.

[0014] A railway car is composed of an underframe not shown for supporting a floor of the car, side frames 10, a roof frame 20 and so on. Interior panels are mounted on the inner sides of the side frames 10 and the roof frame. Doors 30 for entering and exiting the car and windows are disposed on the side frame 10.

[0015] The overhead baggage rack unit denoted as a whole by reference number 50 includes an overhead baggage rack body 100 and a pole 200 for supporting the overhead baggage rack body 100. The overhead baggage rack body 100 is connected to the pole 200 via a bracket portion 160 described in detail later.

[0016] FIG. 2 illustrates the details of the overhead baggage rack body 100.

[0017] The overhead baggage rack body 100 has an integrated structure formed by extruding aluminum alloy, in which the finished product is formed by cutting unnecessary portions off from an extruded material.

[0018] The overhead baggage rack body 100 comprises a front edge portion 110 and a rear edge portion 112 forming crossbeams (disposed along a longitudinal direction of the car body), and beams (hereinafter called transverse members) 114 that connect the front and rear edge portions intermittently. The member has a rectangular planar shape. The areas surrounded by the front edge portion 110, the rear edge portion 112 and the transverse members 114 are cut and formed into openings 130.

[0019] The longitudinal size of the overhead baggage rack body 100 can be selected appropriately according to the quality of the material being subjected to extrusion or the designed size of the overhead baggage rack, and divided into appropriate openings 130 via the transverse members 114. A stepped portion 120 is formed to surround each of the openings 130. An overhead baggage rack 190 made of glass or plastic is placed on the stepped portion. The glass overhead baggage rack 190 is formed of laminated glass for improved strength. The overhead baggage rack 190 is fixed by bonding.

[0020] A grip bar 150 is integrally formed via connecting portions 140 at a lower oblique area of the front edge portion 110 of the overhead baggage rack body 100. In other words, the front edge portion 110, the connecting portions 140 and the grip bar 150 are all formed of aluminum alloy. The connecting portions between the front edge portion 110 and the grip bar 150 are cut and removed as much as possible.

[0021] The upper drawing of FIG. 2 is a side view of the overhead baggage rack, the lower left side drawing of FIG. 2 is a perspective view of the opening, and the right side drawing is a perspective view of the material (shape member) seen from below. The upper drawing of FIG. 3 is a plan view of the overhead baggage rack body 100, the lower view thereof is a front view of the overhead baggage rack body 100, the upper drawing of FIG. 4 is a plan view of the lower drawing, the center portion of the upper drawing of FIG. 4 is a vertical cross-sectional view of the above-mentioned view, the lower drawing of FIG. 4 is a view from the direction of arrow A-A of FIG. 3, the lower drawing of FIG. 5 is a drawing illustrated from the direction of arrow B-B of FIG. 3, the upper drawing is a view from the direction of arrow a-a of the lower drawing, the middle drawing is a view from the direction of arrow b-b of the lower drawing, the lower drawing of FIG. 6 is a view from the direction of arrow C-C of FIG. 3, the upper view is a plan view of the lower drawing, and the drawing at the right side portion of the plan is a vertical cross-section of the same portion.

[0022] The overhead baggage rack body 100 has a rectangular planar shape, wherein the front edge portion 110 and the rear edge portion 112 are connected by transverse members 114, by which openings 130 are defined. The front edge portion 110 and the rear edge portion 112 are parallel.

[0023] The grip bar 150 is integrally formed via connecting portions 140 at a lower oblique area of the front edge portion 110.

[0024] The overhead baggage rack body 100 is fixed via a bracket 160 to the pole 200. An overhead baggage rack 190 is attached using the stepped portion 120 to each of the openings 130 of the overhead baggage rack body 100. The overhead baggage rack can be formed of transparent or semitransparent material such as plastic or glass, or of metal, punched panel, bars or net, which are attached to the openings via bonding or mechanical engagement.

[0025] FIG. 5 shows the details of the overhead baggage rack body 100 and the mounting bracket 160.

[0026] The bracket 160 has a recessed portion corresponding to the outer circumference of the pole 200, and is either bonded or mechanically engaged to the pole 200 via an arced extended portion 170 by bolts 172.

[0027] The bracket 160 has a mounting surface corresponding to the connecting portion 140 of the overhead baggage rack body 100, and the overhead baggage rack body 100 is fixed via bolts 162 to the bracket 160. The holes for the bolts 162 and the contact surface with the bracket 160 are formed simultaneously when the openings 130 and the like are formed via a mechanical cutting process. The above description "formed simultaneously" does not mean that they are actually simultaneously formed, but means that they are substantially formed at the same time.

[0028] FIG. 7 illustrates a process for forming via mechanical processing M_1 the openings 130 for the overhead baggage rack in an aluminum shape member A_1 that is formed via extrusion in the direction of arrow D_1 .

[0029] A space 142 exists between the front edge portion 110 and the grip bar 150 attached via connecting portions, and the grip bar 150 is formed via cutting in the above process. The grip bar 150 is not necessarily directly gripped by passengers. The grip bar 150 can be gripped directly, or known straps can be hung thereon. The distance between the upper surface of the space 142 and the front edge portion is determined so as to allow gripping or straps to be hung thereon. A plurality of straps can be attached on the grip bar.

[0030] It is also desirable to form the pole 200 and the bracket 160 from aluminum alloy material.

[0031] Since the overhead baggage rack body 100 of the overhead baggage rack unit according to the present invention is formed of extruded aluminum shape members, it is light weight and has superior appearance, can be formed cost-effectively, and since the front edge portion of the overhead baggage rack (the connecting portions 140 supporting the grip bar 150) is supported by a pole, the space of the overhead baggage rack is increased, and thus the effective space of the shelf is expanded.

[0032] Furthermore, since the overhead baggage rack is formed by cutting and removing unnecessary portions from an extruded shape member, it is light weight and formed in a cost-effective manner.

[0033] Moreover, by forming the pole, the bracket and the like using aluminum alloy material, the overall weight of the overhead baggage rack unit is reduced and the appearance thereof is improved.

Claims

1. An overhead baggage rack unit of a railway car disposed at an upper portion on an inner side of a side frame along said side frame; comprising
an overhead baggage rack body constituting the overhead baggage rack unit formed by cutting an extruded aluminum alloy material via machining, having an opening between a front edge portion and a rear edge portion;
a transverse member connecting the front edge portion and the rear edge portion; and
an overhead baggage rack mounted on the opening.

2. The overhead baggage rack unit of a railway car according to claim 1, further comprising:

a grip bar disposed in parallel with the front edge portion and being integrally formed with the front edge portion;
and
a space formed between the front edge portion and the grip bar.

3. The overhead baggage rack unit of a railway car according to claim 1, wherein
the overhead baggage rack unit further comprises a bracket attached to the grip bar, the bracket being fixed to a pole supporting the overhead baggage rack unit.

FIG. 1

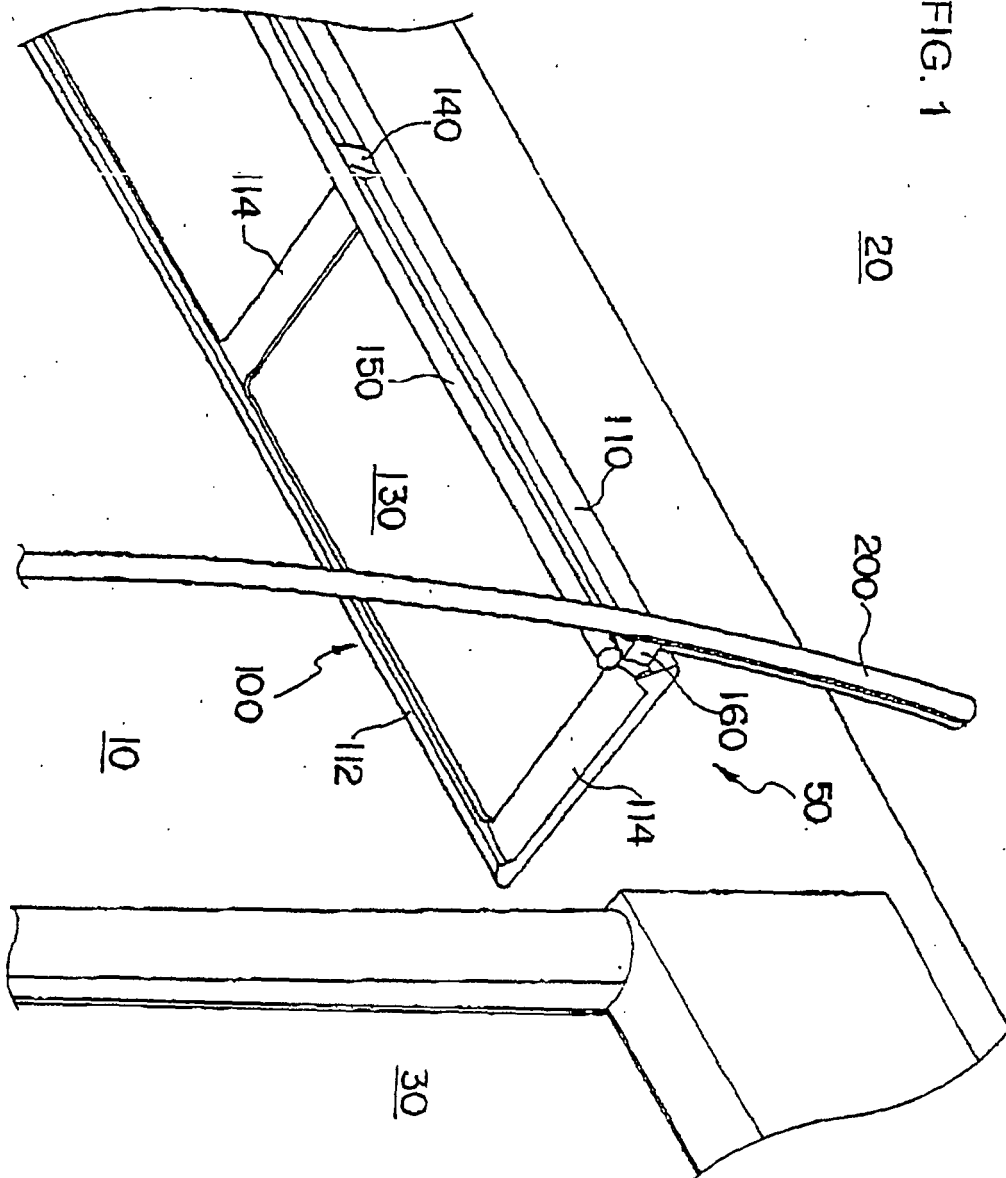


FIG. 2

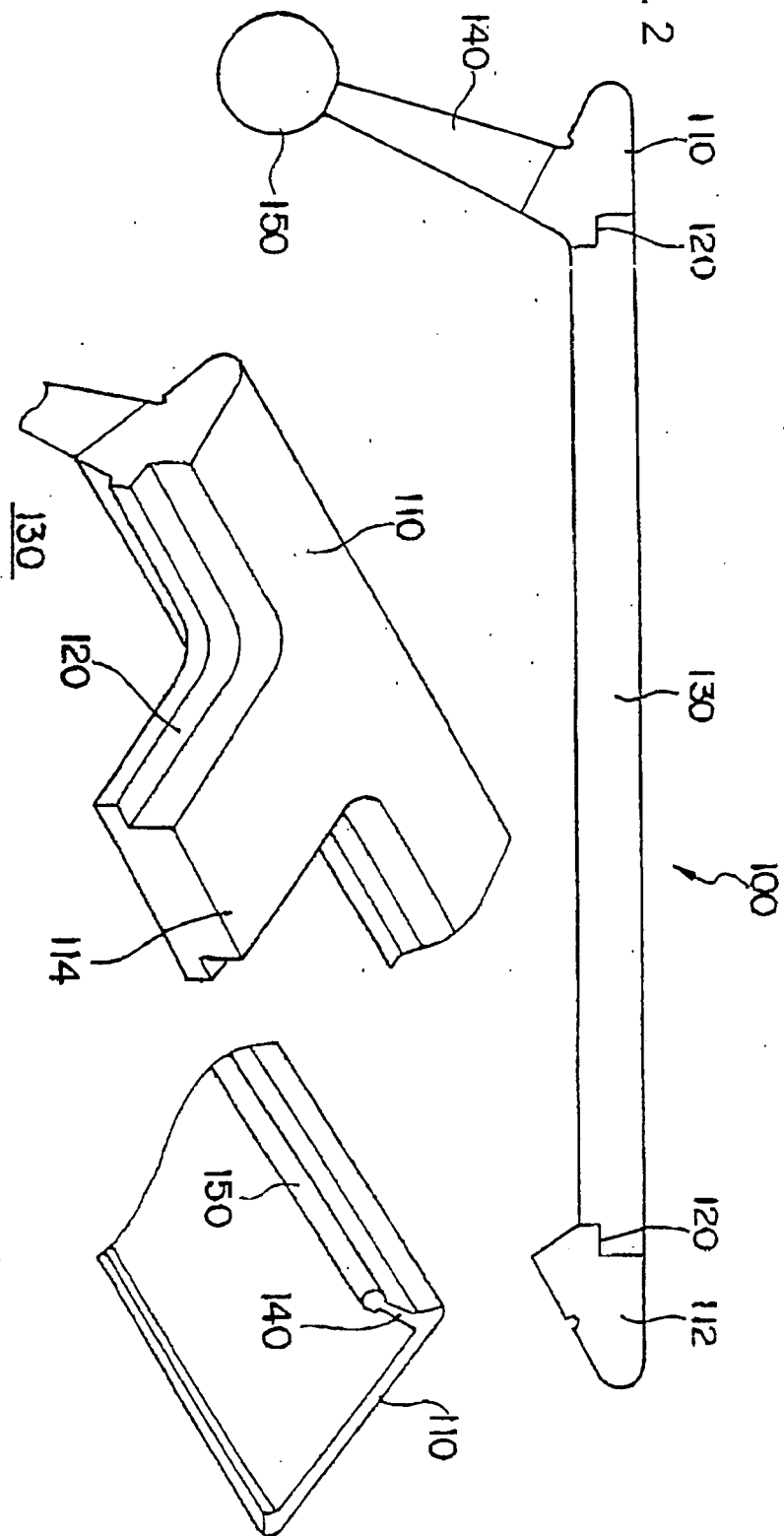


FIG. 3

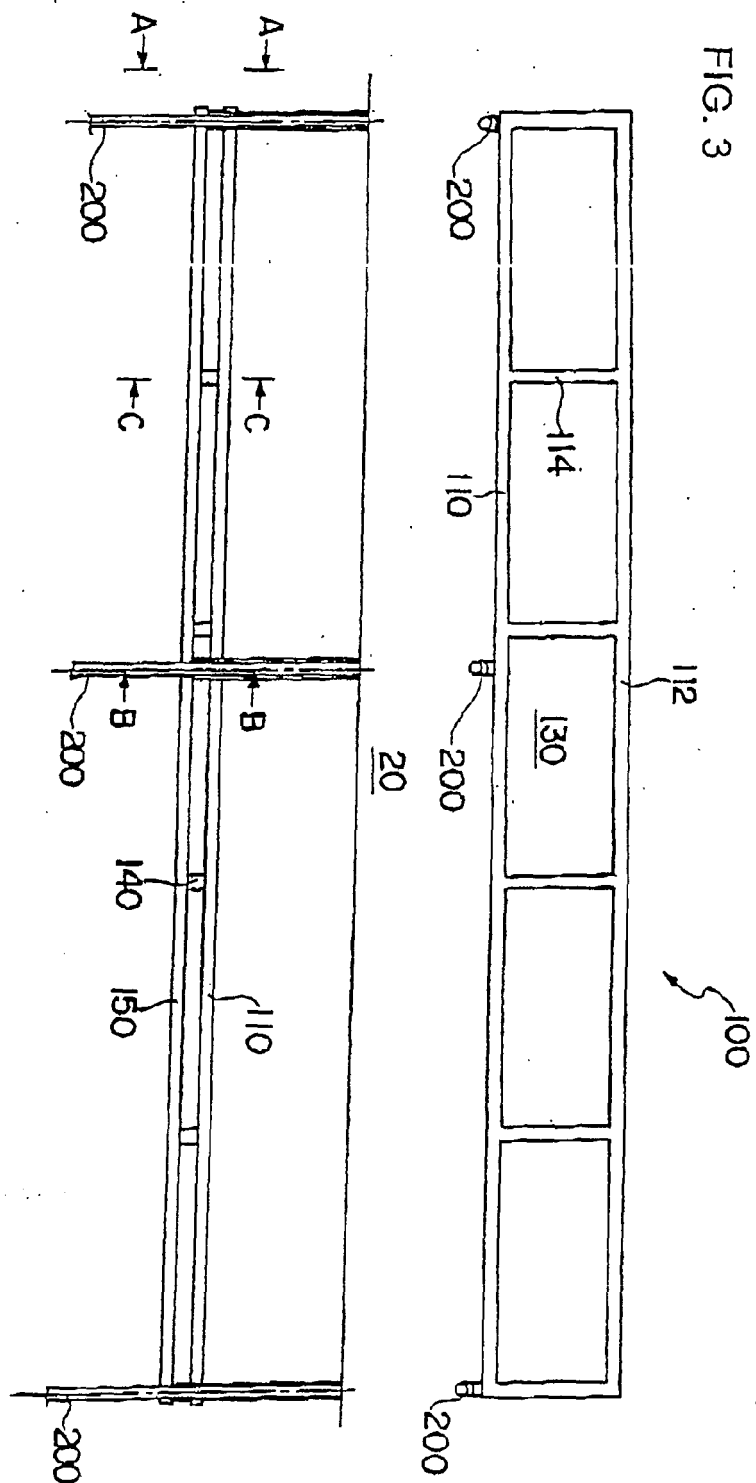
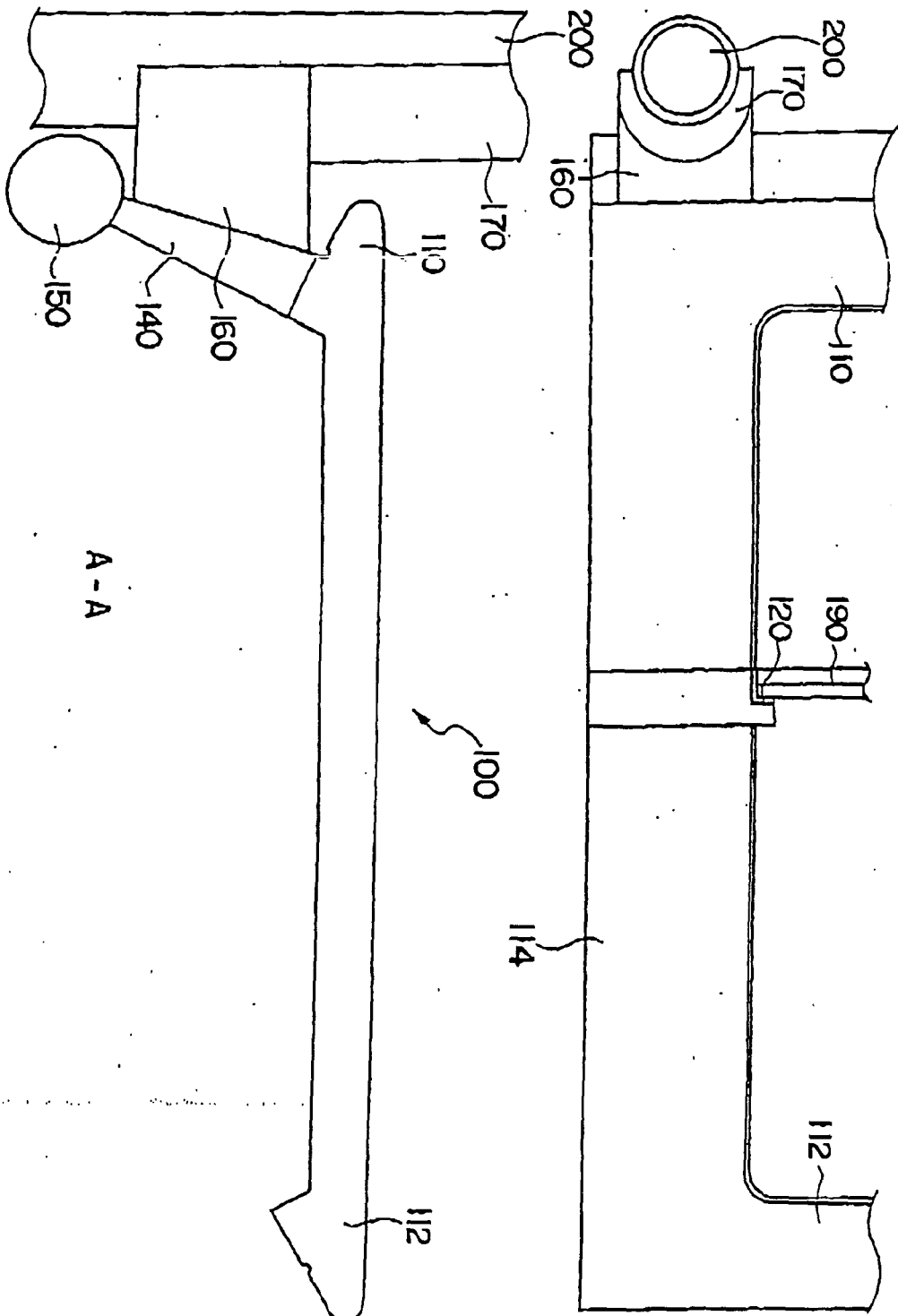


FIG. 4



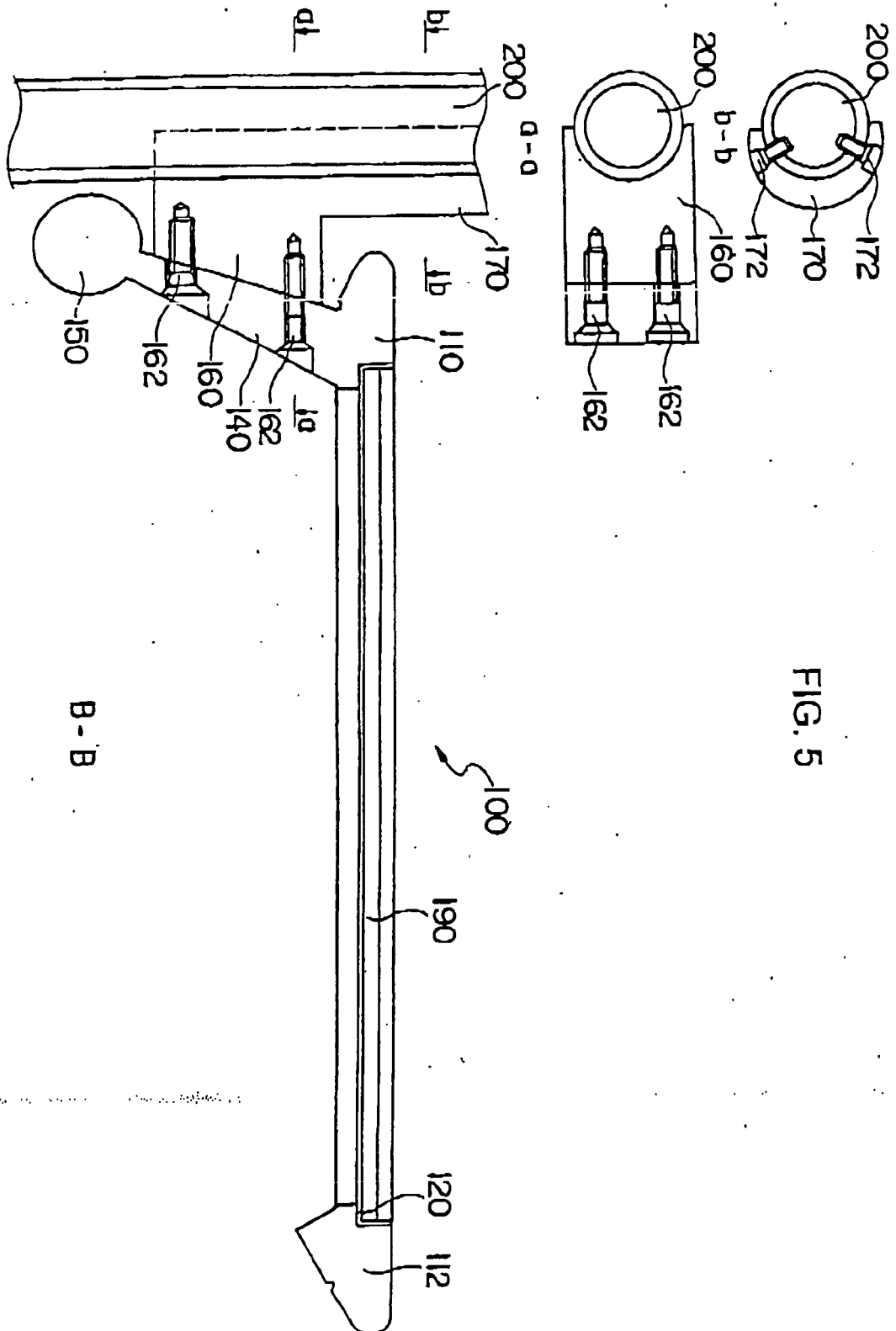
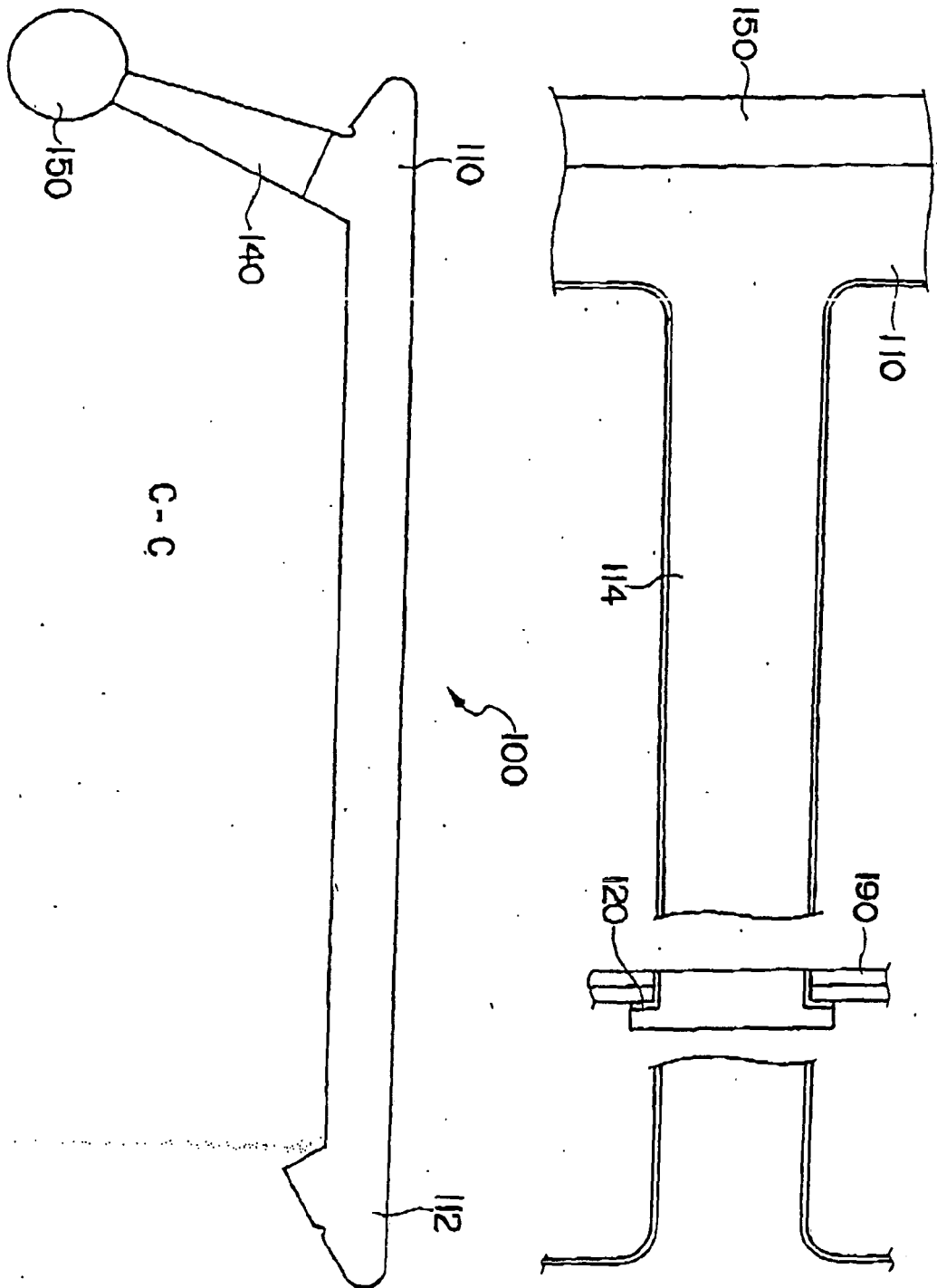
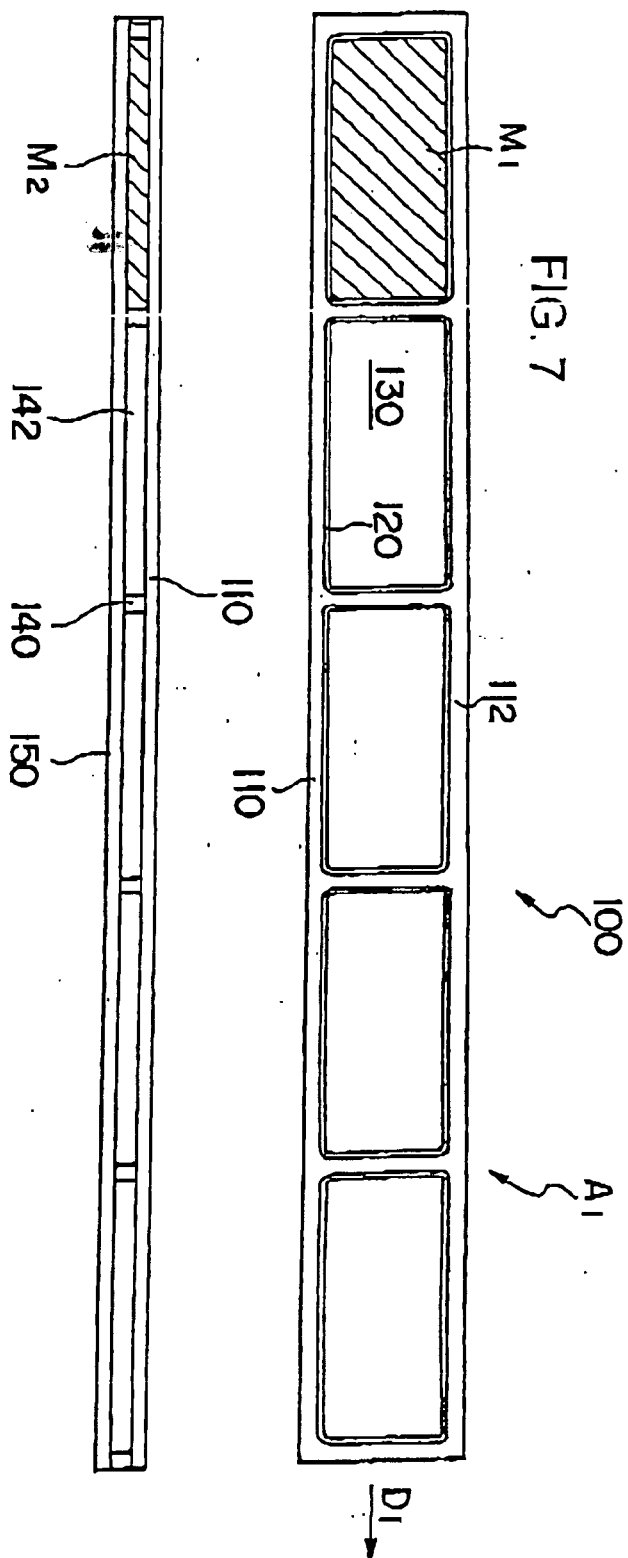


FIG. 6





REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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