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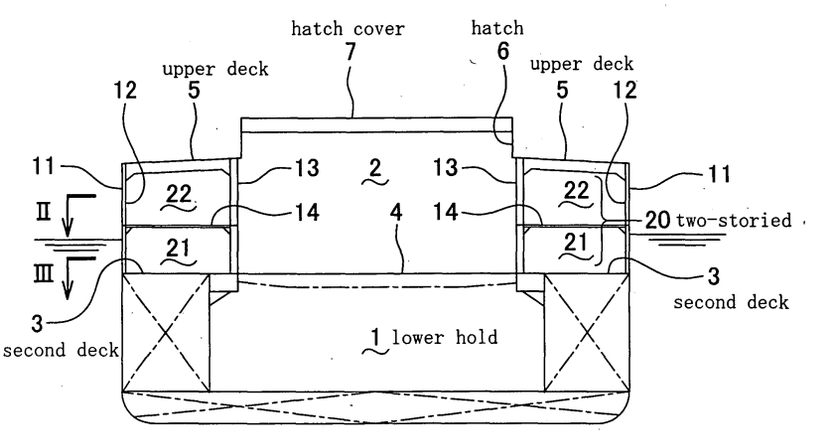
(54) Cargo ship

(57) A cargo ship wherein a second deck 3 divides upper holds 2 and lower holds 1, openings of the second deck 3 are provided with pontoon hatch covers, and the upper holds 2 are provided with hatches 6. Hold-providing decks 14 are installed above the second deck 3 on the right and left sides of the upper holds 2 to provide two-storied deck holds 20, or first deck holds 21 and second deck holds 22. Each hold-providing deck 14 is supported by pillars 13 which are installed, on side walls of the deck holds provided by said hold-providing deck, at intervals in a longitudinal direction of the cargo ship, said side walls of said deck holds being those not along the ship's side, but along the upper holds 2. The pillars 13 are of fixed and movable types.

F I G. 1



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Description

Technical field of the invention

[0001] This invention relates to a cargo ship. More specifically, this invention relates to a general cargo ship to transport general merchandise, vehicles, containers, and steel materials such as pipes.

Background art

[0002] Fig. 9 is a cross section of the central part of the double-deck cargo ship of a prior-art embodiment 1. The reference numerals 101 and 102 are lower and upper holds, respectively, and they are divided by a second deck 103. The reference numeral 104 is a pontoon hatch cover to cover a central opening of the second deck 103. The reference numeral 105 is an upper deck, which has a hatch 106 in its central part. The hatch 106 is provided with a hatch cover 107. The pontoon hatch cover 104 is a steel lid, on which vehicles, etc. can be loaded. Accordingly, heavy cargoes such as steel materials and plant components can be loaded into the lower hold 101 and general cargoes and vehicles can be loaded into the upper hold 102 (Non-patent literature 1).

[0003] Fig. 10 is a cross section of the central part of the triple-deck cargo ship of a prior-art embodiment 2. The reference numerals 101, 102a, and 102b are lower, middle, and upper holds. The lower and middle holds 101 and 102a are divided by a lower pontoon hatch cover 104a; the middle and upper holds 102a and 102b, by an upper pontoon hatch cover 104b. Heavy cargoes can be loaded into the lower hold 101; vehicles and general cargoes, into the middle hold 102a; vehicles, into the upper hold 102b.

[0004] If the cargo ships of the above prior-art embodiments 1 and 2 are of dead weight up to 20,000 tons, the pontoon hatch covers 104, 104a, and 104b are of width up to 15 m and, hence, can be handled. If the cargo ships are of dead weight over 20, 000 tons and the pontoon hatch covers 104, 104a, and 104b are of width over 15 m, the pontoon hatch covers are considerably heavy; accordingly, the handling of the pontoon hatch covers such as the housing of them would be difficult and dangerous. Besides, as only lightweight cargoes such as vehicles can be loaded on the pontoon hatch covers because of their strength, multipurpose mixed-cargo loading is difficult.

[0005] Moreover, it is difficult to use effectively the cargo-loading spaces on the second decks 103 of cargo ships of the above prior-art embodiments 1 and 2.

[0006] In Fig. 10, the reference letters "S" and "P" indicate the sectional views of starboard and port sides, respectively, the former sectional view taken at the position of a frame 111, the latter sectional view taken at the position of a web frame 112.

[0007] Fig. 11 is an enlarged plan view of part of the second deck 103 of Fig. 10. The reference numeral 113 is an outer plate which is supported by a plurality of frames 111, and a web frame 112 is disposed every several frames 111. These web frames 112 are wide; accordingly, the loading space on the second deck 103 is partially narrowed by the web frames 112 and, hence, cargoes cannot be loaded efficiently into the loading space.

[0008] [Non-patent literature 1] *Drawings of Names of Sections and Parts of Hulls* (Revised Edition), pp. 54-55 by Masaru Ikeda, Kaibundo, 1979

Disclosure of invention as claimed in terms of the technical problem and its solution, stating advantageous effects with reference to back ground art

[0009] In view of the above problems, the object of the present invention is to provide a cargo ship whose pontoon hatch covers are easy to handle, on whose second deck cargoes can be loaded efficiently, and whose degree of freedom of mixed-cargo loading is high even if the cargo ship is large and wide.

[0010] According to the claim 1, there is provided a cargo ship comprising (i) an upper deck which has hatches for upper holds, (ii) a second deck which divides the upper holds and lower holds and has openings with pontoon hatch covers, and (iii) a hold-providing deck which is installed above the second deck on each of the right and left sides of the upper holds to provide deck holds.

[0011] According to the claim 2, there is provided the cargo ship of claim 1, wherein each deck hold is two-storied.

[0012] According to the claim 3, there is provided the cargo ship of claim 2, wherein each hold-providing deck is supported by pillars which are installed, on side walls of the deck holds provided by said hold-providing deck, at intervals in a longitudinal direction of the cargo ship, said side walls of said deck holds being those not along the ship' s side, but along the upper holds.

[0013] According to the claim 4, there is provided the cargo ship of claim 3, wherein the pillars are of fixed and movable types.

[0014] The advantages offered by the invention of claim 1 are as follows. Because deck holds are provided on the right and left sides of upper holds, the width of hatches of upper holds and the width of pontoon hatches of lower holds are reduced by the width of deck holds. Accordingly, if the cargo ship is large and wide, the pontoon hatch covers can easily be handled. Besides, as various kinds of cargoes can be loaded into the deck holds, the degree of freedom of mixed-cargo loading is high.

[0015] The advantage offered by the invention of claim 2 is as follows. Because the deck holds are two-storied and different kinds of cargoes can be loaded into different spaces, the degree of freedom of mixed-cargo loading is high.

[0016] The advantages offered by the invention of

claim 3 are as follows. Because the hold-providing decks are supported by pillars, the strength of two-storied deck holds is high. Besides, as the hold-providing decks are supported by compact pillars alone without using large web frames, the hold-providing decks are rectangular; accordingly, cargoes can efficiently be loaded onto the hold-providing decks.

[0017] The advantage offered by the invention of claim 4 is as follows. By moving the movable pillars, cargoes can be loaded easily and vehicles can run smoothly.

Description of drawings

[0018] The features and advantages of the present invention will become more clearly appreciated from the following description in conjunction with the accompanying drawings, in which:

Fig. 1 is a cross section of a cargo ship in accordance with the present invention.
Fig. 2 is a plan view taken along the arrowed line II of Fig. 1.
Fig. 3 is a plan view taken along the arrowed line III of Fig. 1.
Fig. 4 is an enlarged plan view of part of a hold-providing deck 14 of Fig. 1.
Figs. 5 to 8 are illustrations of loading patterns of cargoes into the cargo ship of Fig. 1.
Fig. 9 is a cross section of the central part of the double-deck cargo ship of the prior-art embodiment 1.
Fig. 10 is a cross section of the central part of the triple-deck cargo ship of the prior-art embodiment 2.
Fig. 11 is an enlarged plan view of part of the second deck 103 of the prior-art embodiments 1 and 2.

Description of a least on way of carrying out the invention

[0019] Referring to drawings, a preferred embodiment of the present invention will be described below.

[0020] Fig. 1 is a cross section of a cargo ship in accordance with the present invention. Fig. 2 is a plan view taken along the arrowed line II of Fig. 1; Fig. 3 is a plan view taken along the arrowed line III of Fig. 1. Fig. 4 is an enlarged plan view of part of a hold-providing deck 14.

[0021] In Fig. 1, the reference numerals 1 and 2 are lower and upper holds, respectively. The lower and upper holds 1 and 2 are divided by a second deck 3. The second deck 3 has an opening in its central part, and the opening is provided with a pontoon hatch cover 4.

[0022] The reference numeral 5 is an upper deck, which has in its central part a hatch 6, which is provided with a hatch cover 7.

[0023] The above structure is the same as the structure of cargo ships currently in service.

[0024] As shown in Figs. 1 and 4, on each side of the ship, an outer plate 11 is installed between the second and upper decks 3 and 5 and fixed to frames 12, fixed pillars 13 are installed on the side of the hatches 6, and a hold-providing deck 14 is supported by the frames 12 and the fixed pillars 13. The hold-providing decks 14 will do if they are strong enough to load vehicles, pipes, and steel materials.

[0025] As described above, on each side of the ship, a hold-providing deck 14 is installed between the second and upper decks 3 and 5 to provide a two-storied deck hold 20, or a first deck hold 21 under the hold-providing deck 14 and a second deck hold 22 on the hold-providing deck 14.

[0026] On the side of the hatches, an appropriate number of fixed pillars 13 are so arranged along the upper holds 2, at intervals in a longitudinal direction of the hull, so that they will have necessary strength. The fixed pillars 13 are made of H-steel or the like so that they will be compact yet strong. Because each hold-providing deck 14 is supported by the frames 12 on one side and the compact fixed pillars 13 on the other side, it is unnecessary to use large-sized web frames (112 of Fig. 10) to support said hold-providing deck 14. Thus, both the first and second deck holds 21 and 22 are square and free of inward protrusions. Accordingly, cargoes can efficiently be loaded into the first and second deck holds 21 and 22.

[0027] If movable pillars 13 are installed between the fixed pillars 13, each hold-providing deck 14 can be supported more securely. The movable pillars may be of a folding type, a mobile type, or any other type. With such movable pillars, the opening of each deck hold 20 can be made large while the necessary supporting strength is maintained. Thus, cargoes can easily be loaded into each deck hold 20. For example, vehicles can run easily, long cargoes such as pipes and steel materials can be carried in, and forklifts can be used to carry in such long cargoes.

[0028] In Figs. 2 and 3, the reference signs H1, H2, H3, and H4 indicate first, second, third, and fourth holds, respectively, and the second and third holds H2 and H3 are provided with deck holds 20. The first hold H1 on the bow side and the fourth hold H4 on the stern side are of ordinary structure. If the cargo ship has a long hull and have three or more intermediate holds between the bow hold and the stern hold, all or some of the intermediate holds may be provided with deck holds 20. The cargo ship has a ramp 31 to load vehicles into the first and second deck holds 21 and 22.

[0029] Figs. 5 to 8 are illustrations of loading patterns of cargoes into the cargo ship according to the present invention.

(1) Example of Loading of Fig. 5

[0030] Pontoon hatch covers 4 are provided.

[0031] General cargoes (not shown) are loaded into

the lower holds 1 (onto the floors of the lower holds 1) and into the upper holds 2 (onto the pontoon hatch covers 4).

[0032] Pipes, steel materials, etc. are loaded into the first and second deck holds 21 and 22. Because pipes, steel materials, etc. can easily be dressed in line, large quantities of them can efficiently be loaded into the long, narrow first and second deck holds 21 and 22.

(2) Example of Loading of Fig. 6

[0033] Pontoon hatch covers 4 are provided.

[0034] General cargoes (not shown) are loaded into the lower holds 1 (onto the floors of the lower holds 1) and into the upper holds 2 (onto the pontoon hatch covers 4).

[0035] Vehicles are loaded into the first and second deck holds 21 and 22. Because vehicles can easily be dressed in line, many vehicles can efficiently be loaded into the relatively narrow first and second deck holds 21 and 22. Besides, as the ramp 31 is provided, vehicles can be loaded efficiently.

(3) Example of Loading of Fig. 7

[0036] Pontoon hatch covers 4 are provided.

[0037] General cargoes (not shown) are loaded into the lower holds 1 (onto the floors of the lower holds 1).

[0038] As vehicles are relatively light in weight, they can be loaded onto the pontoon hatch covers 4. Vehicles may be loaded into the upper holds 2 through the ramp 31 or through the hatches 6 by using a crane or the like.

[0039] Vehicles are loaded into the first and second deck holds 21 and 22.

(4) Example of Loading of Fig. 8

[0040] Containers are loaded into the lower and upper holds 1 and 2.

[0041] Vehicles are loaded into the first and second deck holds 21 and 22.

[0042] Containers are loaded onto the upper decks 5.

[0043] Containers are loaded onto the hatch cover 7.

[0044] Pontoon hatch covers 4 may be provided and containers may be loaded into the lower and upper holds 1 and 2, or containers may be loaded into a single hold consisting of the lower and upper holds' spaces without a pontoon hatch cover 4.

How the invention is capable of industrial exploitation

[0045] Loading patterns of the cargo ship of the present invention are not limited to the above four examples, but various other loading patterns are available; therefore, the cargo ship has a high utility value as a multipurpose cargo ship.

Claims

1. A cargo ship comprising:

   an upper deck which has hatches for upper holds;
   a second deck which divides the upper holds and lower holds and has openings with pontoon hatch covers; and
   a hold-providing deck which is installed above the second deck on each of the right and left sides of the upper holds to provide deck holds.

2. The cargo ship according to claim 1, wherein each deck hold is two-storied.

3. The cargo ship according to claim 2, wherein each hold-providing deck is supported by pillars which are installed, on side walls of the deck holds provided by said hold-providing deck, at intervals in a longitudinal direction of the cargo ship, said side walls of said deck holds being those not along the ship's side, but along the upper holds.

4. The cargo ship according to claim 3, wherein the pillars are of fixed and movable types.

FIG. 1

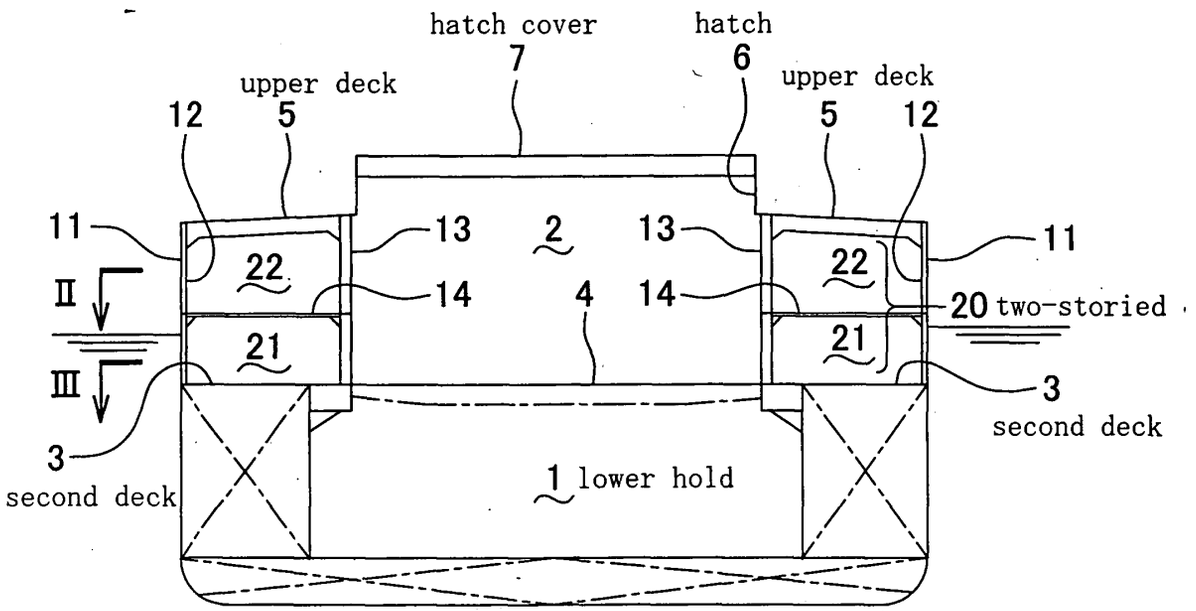

hatch cover
7
hatch
6
upper deck
5
upper deck
5
12
12
11
13
2
13
11
22
22
14
4
14
20 two-storied
II
21
21
III
3
3
second deck
second deck
1 lower hold

FIG. 2

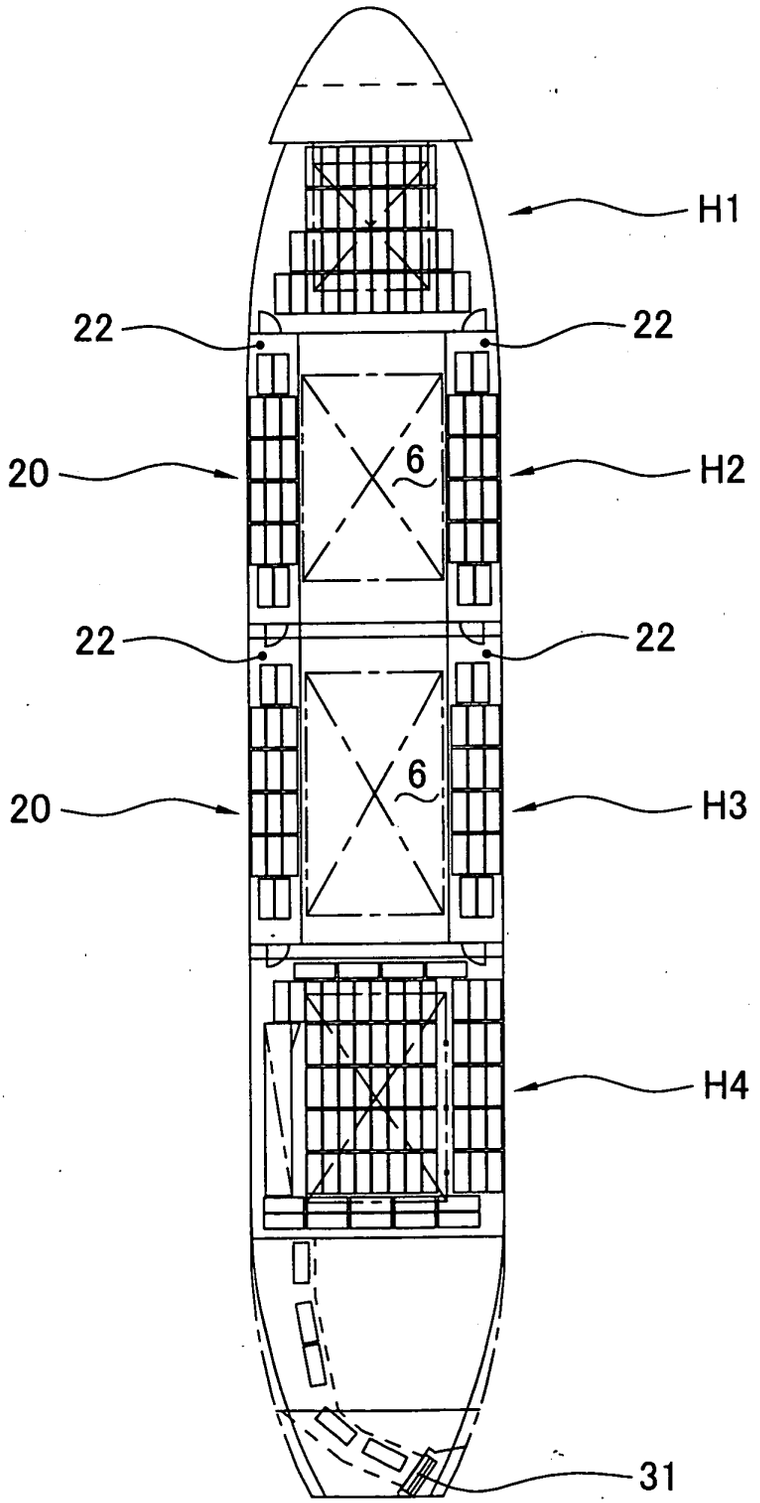


FIG. 3

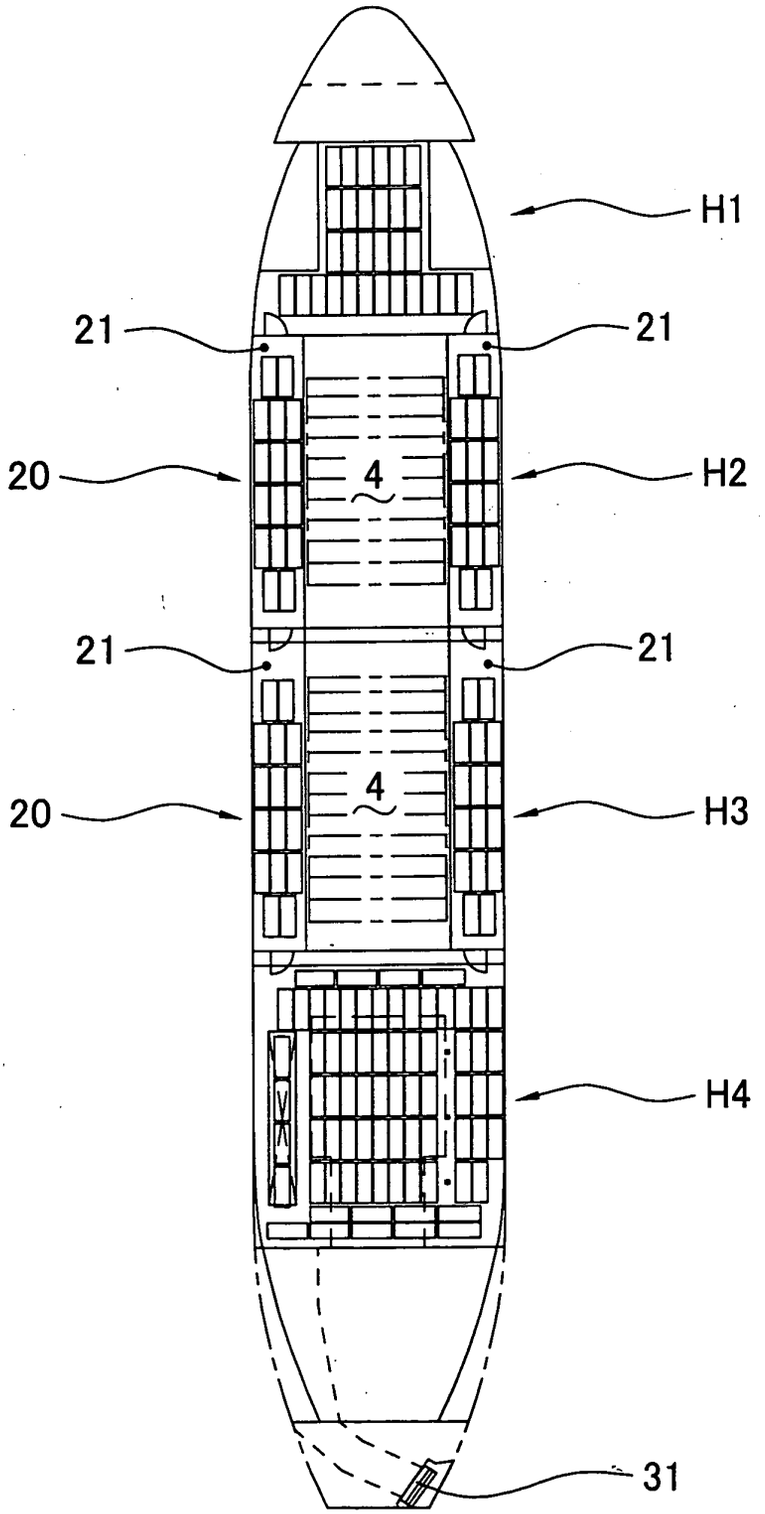


FIG. 4

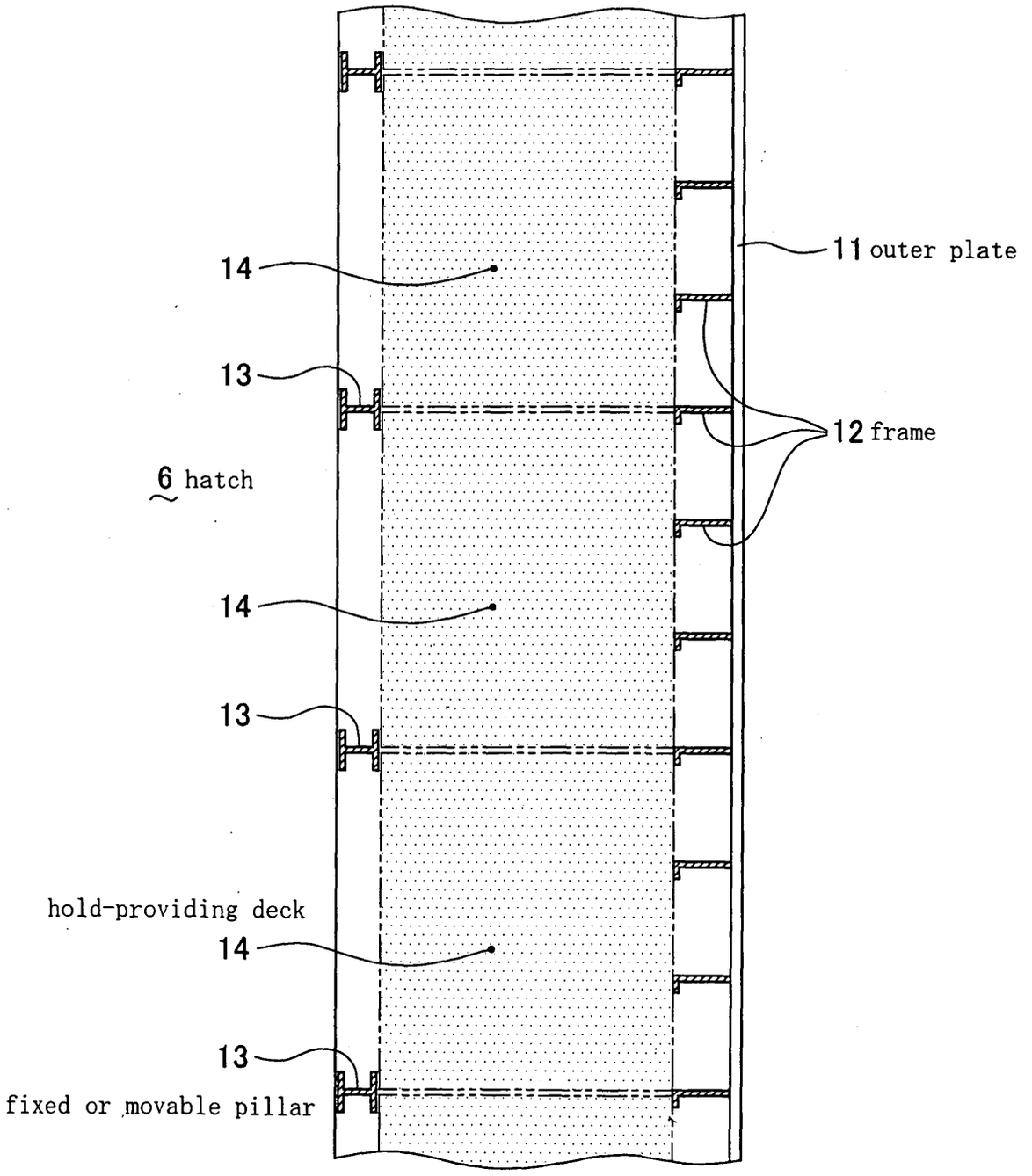

14
11 outer plate
13
12 frame
6 hatch
14
13
hold-providing deck
14
13
fixed or movable pillar

FIG. 5

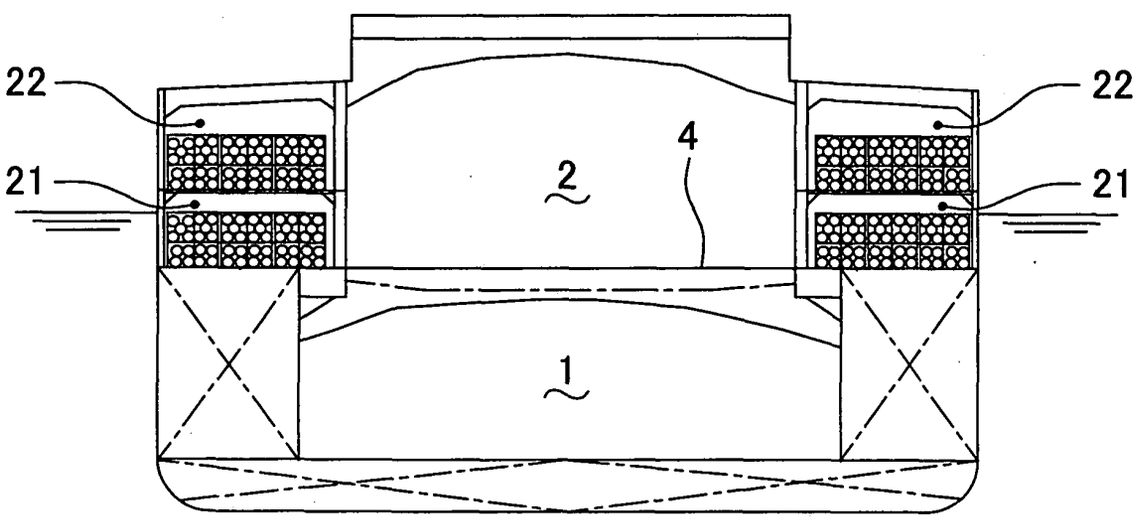


FIG. 6

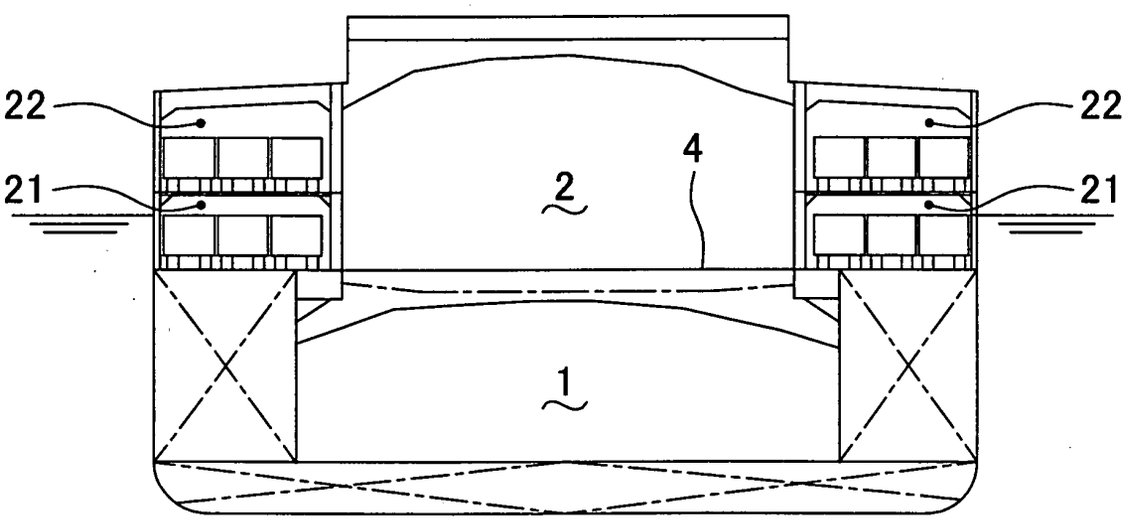


FIG. 7

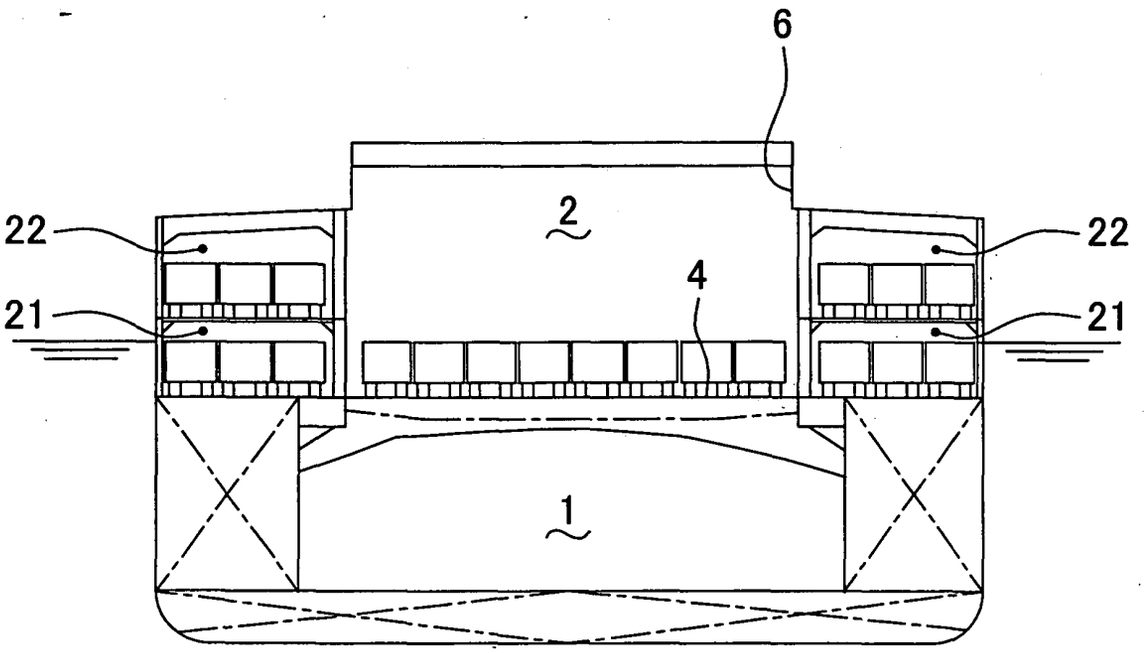


FIG. 8

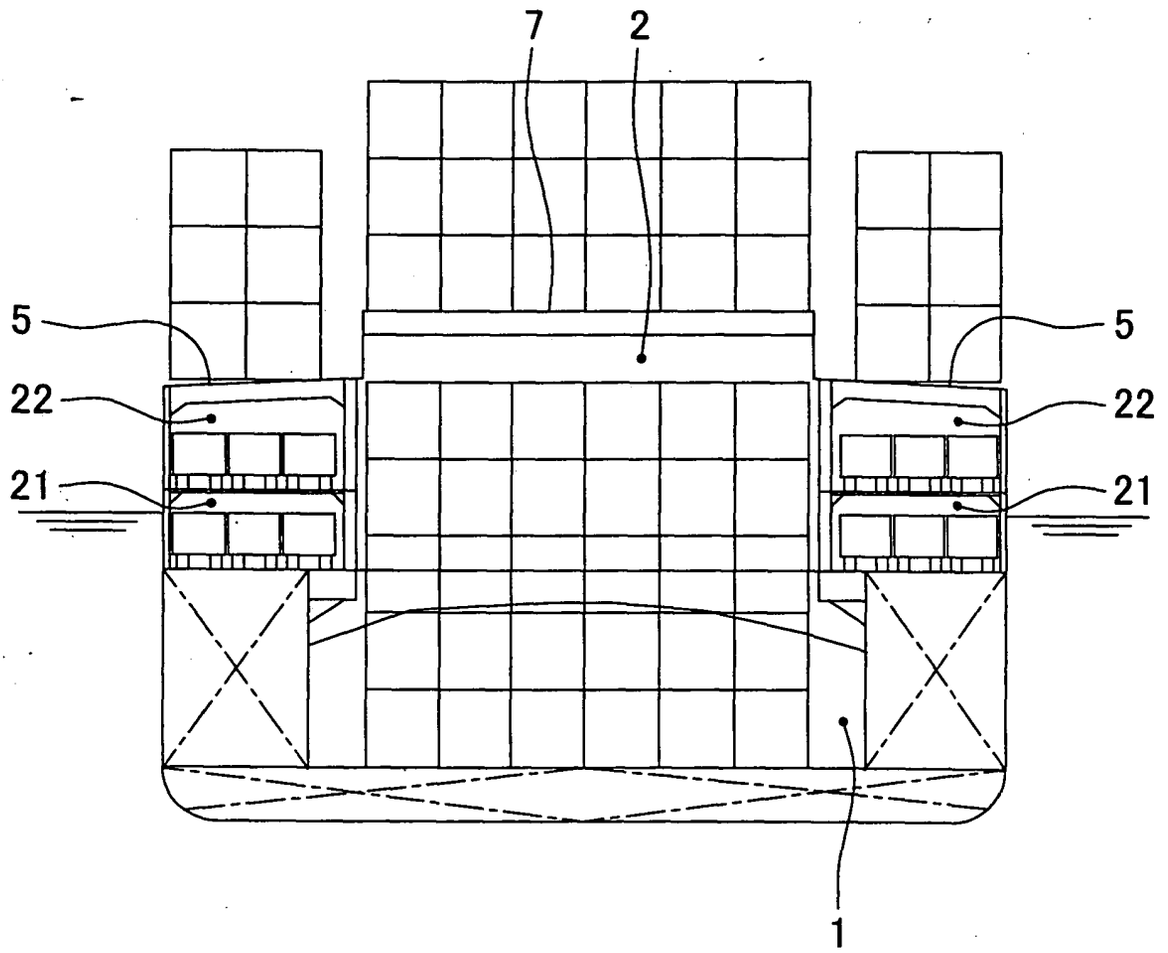


FIG. 9

PRIOR ART

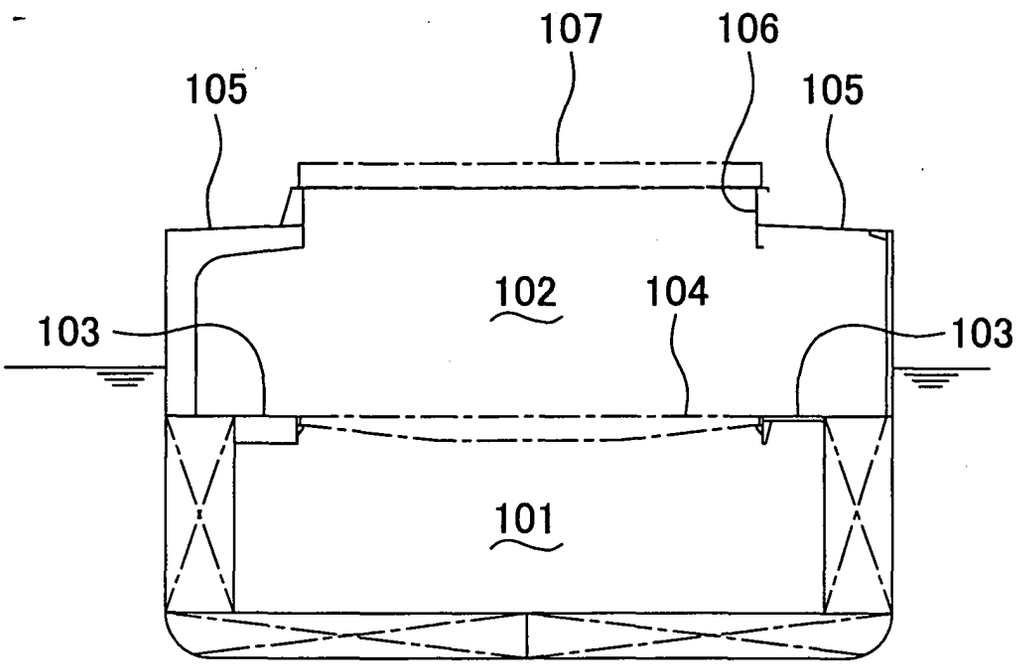


FIG. 10

PRIOR ART

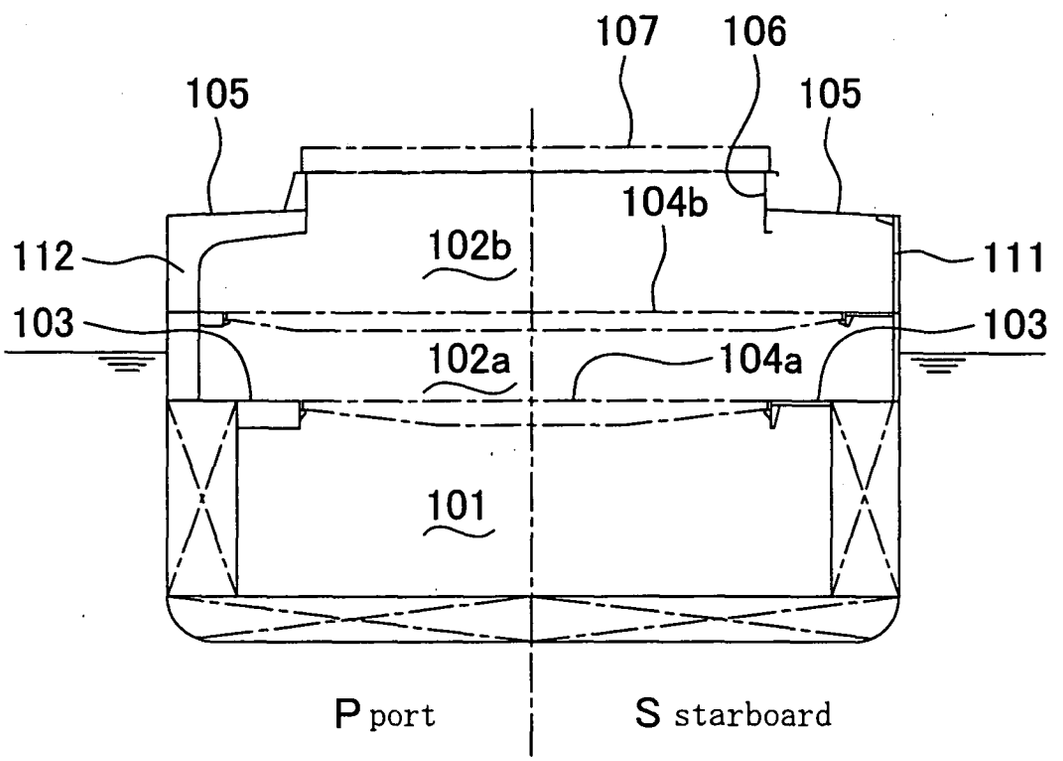
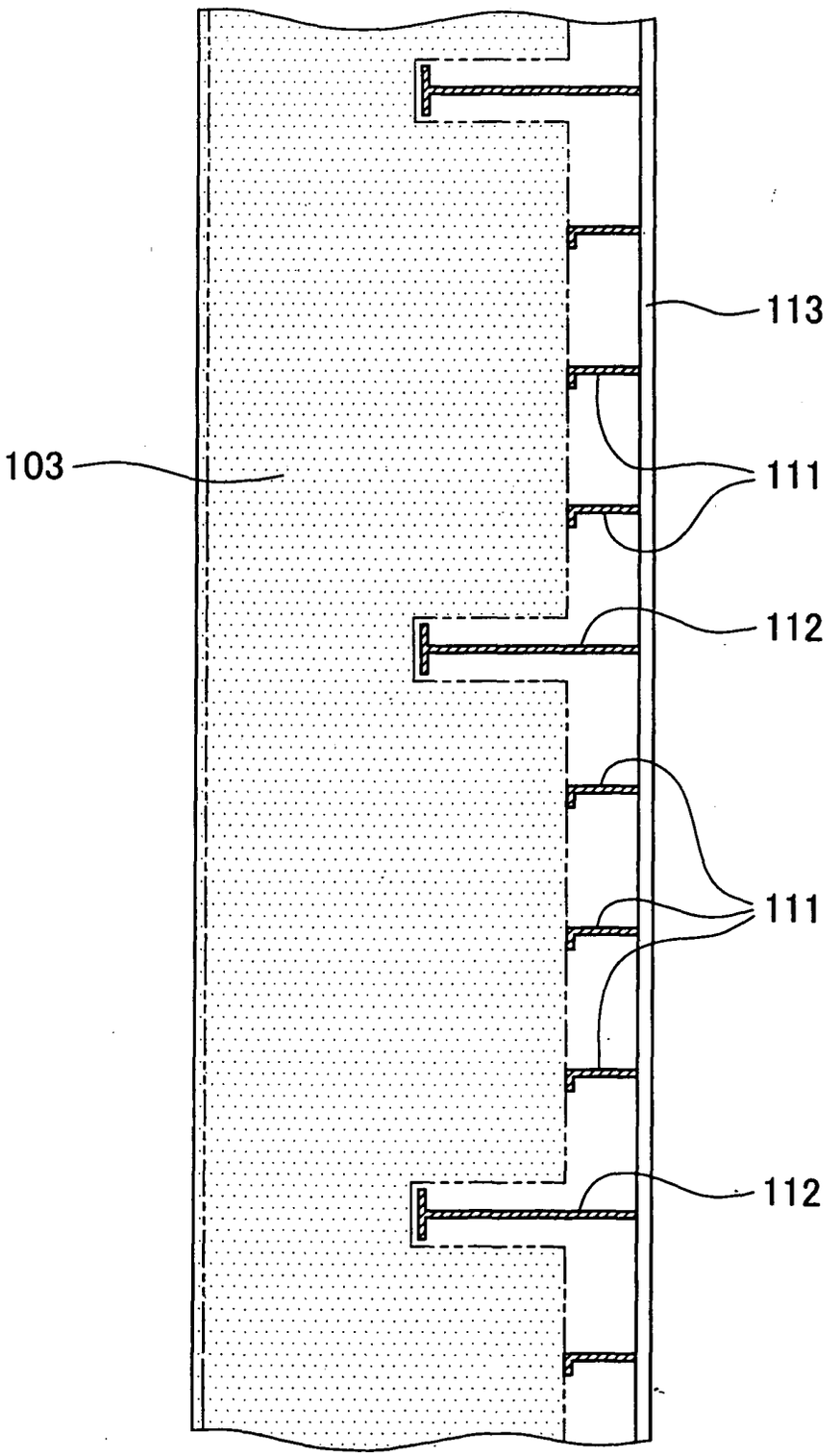


FIG. 11

PRIOR ART



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EUROPEAN SEARCH REPORT

Application Number
EP 04 01 5592

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.7)
A	US 2 923 265 A (PONTONI GIOVANNI ET AL) 2 February 1960 (1960-02-02) * the whole document * -----	1	B63B25/00 B63B25/02 B63B19/12 B63B3/48
A	US 3 380 422 A (BACHKO NICHOLAS) 30 April 1968 (1968-04-30) * figures 1,2,16,21 * -----	1	
A	DE 25 12 379 A1 (LANGENBERG,HANS,DIPL.-ING) 23 September 1976 (1976-09-23) * page 4, last paragraph * * page 8, last paragraph * * figures 1,4 * -----	1	
A	US 6 105 525 A (RAPELI ET AL) 22 August 2000 (2000-08-22) * figures 2-5 * -----	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	17 May 2005	Nicol, Y

CATEGORY OF CITED DOCUMENTS

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17-05-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2923265 A	02-02-1960	NONE	
US 3380422 A	30-04-1968	NONE	
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