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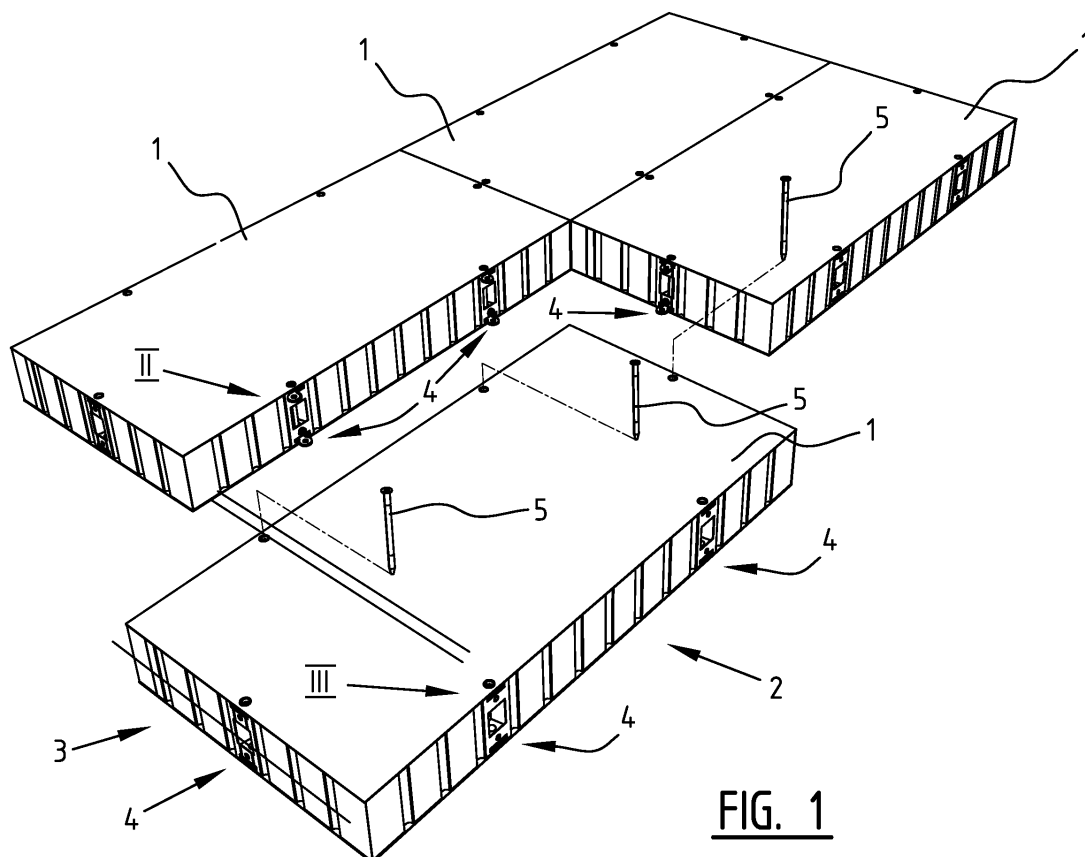
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(54) **System for coupling pontoons**

(57) The invention relates to a system for coupling at least two pontoons, the system comprising at least one coupling for mutually coupling two pontoons at a time,

for which purpose the coupling can be placed between sides of the two pontoons which are adjacent in the coupled situation, wherein the coupling is arranged between the outer ends of the sides.



**FIG. 1**

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## Description

**[0001]** The present invention relates to a system for coupling pontoons, in particular at least two pontoons for coupling, the system comprising at least one coupling for mutually coupling at least two pontoons at a time.

**[0002]** Such a system is generally known in the art, reference for instance being made here to the European patent publication EP-A-0.861.772 in which such a system is disclosed.

**[0003]** Such a known system has the feature that the pontoons are coupled to each other at the corners, wherein some clearance occurs. This clearance is removed with pressing or pushing means situated between the outer ends of sides of the pontoons along the length thereof.

**[0004]** In an individual embodiment of the couplings such spacing, pushing or pressing means make the general configuration and construction of the known system difficult to realize, this requiring many operations. This is a significant drawback of the known art.

**[0005]** Such system is known from WO 2007/084074. This publication shows a system for coupling for instance pontoons. The system comprises two coupling parts, each attached to a pontoon. Each coupling part comprises a vertical receiving recess for receiving a locking bar. The locking bar is arranged in the receiving recesses of both pontoons. The locking bar can have the shape of a dog's bone.

**[0006]** The publication WO 01/54969 shows a system for coupling floating modules. The coupling is formed by interlocking male and female teeth. The male teeth have protruding parts and the female teeth have openings, wherein the protruding parts of the male teeth can be received in the openings of the female teeth.

**[0007]** The present invention has for its object to obviate, or at least alleviate, the drawbacks of the above stated known art, for which purpose a system is provided which is distinguished from the known system by a substantially vertically extending passage for receiving a locking pin therein. The locking pin can then be inserted into the passage, wherein connecting elements such as inserts extend to an adjacent pontoon and are there also engaged by a locking pin to be utilized in the adjacent pontoon. A very simple system can thus be provided. The coupling herein comprises at least one slot transversely of the passage for the locking pin and at least one insert for placing in the slot, and with a hole for receiving the locking pin therein. The insert can function as connecting element, which can then extend between the adjacent pontoons. Receiving of the locking pin in the hole in the insert provides a determined measure of freedom of rotation of the insert around the locking pin. The slot further has, at least in the direction transversely of the passage, larger dimensions than a part of the insert to be introduced into the slot. The locking pin will then still always hold the insert in place, and the insert can rotate around the pin for the purpose of orientation with

an approaching pontoon that has to be coupled to the pontoon in which the inserts have already been mounted or arranged. This is particularly favourable because the insert can then rotate about the locking pin, which then functions as a kind of rotation shaft and is, in a manner of speaking, as such substantially or wholly self-adjusting. By securing the insert with the locking pin in one of the two adjacent pontoons, and subsequently bringing another of the adjacent pontoons alongside, introducing the inserts into slots therein and then placing similar locking pins into the then adjacent pontoons, a very reliable and robust connection or coupling can be realized between the adjacent pontoons. A considerable inventive step is thus realized with new measures.

**[0008]** The present invention has various preferred embodiments as defined in the dependent claims.

**[0009]** The coupling can preferably be placed between sides of the two pontoons which are adjacent in the coupled situation, wherein the coupling is arranged between the outer ends of the sides. It is thus possible to provide a combined configuration which is easier to assemble, while the function of the spacing or pushing or pressing means can in fact be dispensed with.

**[0010]** The coupling can preferably further comprise a cassette. Such a cassette is a component or element of a pontoon which can be separately manufactured, and in a preferred embodiment can be integrated into at least one of the two pontoons for connecting or coupling. In an optionally integrated embodiment such a cassette can in any case preferably be recessed to some extent into the outer peripheral form of a pontoon, in order to enable a close connection of adjacent pontoons to each other. This by no means precludes that the cassettes can also be arranged on the outer surface on the sides of the adjacent pontoons.

**[0011]** The cassettes must then in any case be firmly connected or secured to the relevant pontoon of the two pontoons for connecting or coupling in order to realize a strong coupling or connection that is sufficiently robust during coupling or connecting of the adjacent pontoons.

**[0012]** Reference has already been made above to the insert. It should be noted that this preferably has a substantially figure eight-shaped outer peripheral form. The hole for receiving the locking pin can then be made in each case in one of the round parts of the insert, and two holes can thus be provided for insertion of locking pins associated with the adjacent pontoons for the purpose of coupling thereof. Particularly in an embodiment with a figure eight-shaped outer peripheral form of the insert, it can be favourable for the hole to have a size closely corresponding to the dimensions of locking pin. The insert will thus be engaged by the locking pin with little clearance. A coupling or connection of the adjacent pontoons can in this way be realized which has little clearance. In a further preferred embodiment a system according to the invention can have the feature that at least one of the sides of at least one of the two pontoons comprises a receiving part for introducing a coupling piece therein.

Such a coupling piece can be manufactured from metal or plastic and serve to effect a pre-desired intermediate distance between the adjacent connected and coupled pontoons. The dimensioning of the insert, when it is applied, can be modified thereto. A kind of spacer can thus be provided, for instance in the form of a ring or plate, relative to which pins or bushes can extend so as to be accommodated in the receiving part for insertion therein of the coupling piece in each of the sides of the at least two pontoons. Such spacers are easy to arrange during coupling of the at least two pontoons, are to some extent compressible so as to exert a pushing or pressing force in elastic manner between the two adjacent pontoons once they have been coupled in order to hold them at a limited and desired intermediate distance. Already noted above in respect of an insert that it is possible to realize an orienting effect, and a similar function can be imparted to a coupling piece when it for instance comprises an aligning element. Such an aligning element can be embodied as a pin or bush with a tip, wherein the outer end of the tip can be centered on the receiving parts for receiving this bush or pin with tip therein in order to then bring the two pontoons for coupling or connecting closer to each other, wherein the tip of the coupling piece has a centering action for bringing about a desired alignment of the two pontoons relative to each other. The orienting effect of an insert as stated and described above is then less critical.

**[0013]** Following the foregoing elucidation of main points of the present invention, an embodiment of the invention will be described hereinbelow in more detail with reference to the accompanying drawing, in which the same or similar parts, aspects and components are designated with the same reference numerals, and wherein the present invention should not be interpreted as being limited in any way to any of the shown or described embodiments, and in which:

Fig. 1 shows a perspective view of the progress of mutual coupling of pontoons lying on a water surface; Fig. 2 shows a perspective view along arrow II in fig. 1;

Fig. 3 shows a perspective view along arrow III in fig. 1; and

Fig. 4 shows in more detail the parts, elements and components used in a coupling for mutual coupling of adjacent pontoons as already shown in fig. 1.

**[0014]** The figures will be described collectively hereinbelow.

**[0015]** Fig. 1 shows an assembly of individual pontoons 1. The individual pontoons 1 each have two long sides 2 and two short sides 3. Two cassettes 4 are arranged along the long sides 2 of each of pontoons 1, and a single cassette 4 is arranged along each of the short sides 3 of pontoons 1. Cassettes 4 are distributed evenly along the long sides 2 of pontoons 1, and a cassette 4 is arranged in the middle of short sides 3 of pontoons 1.

**[0016]** Cassettes 4 are integrated into the body of pontoons 1. Cassettes 4 can likewise be fixed to or in pontoons 1.

**[0017]** Pontoons 1 are connected by coupling cassettes 4 using locking pins 5 in a manner to be further described hereinbelow. Fig. 2 shows a perspective view along arrow II in fig. 1. This shows clearly that the cassette 4 shown therein is integrated into side surface 6 of pontoon 1.

**[0018]** Also shown is that inserts 7 are arranged in slots 8 in cassette 4. Locking pin 5 is likewise inserted into a passage 9 extending through cassette 4.

**[0019]** Inserts 7 are fixed when inserts 7, which are figure eight-shaped, are placed in slots 8 and locking pin 5 is then lowered into passage 9. Inserts 7 have for this purpose two holes 10, wherein only a single hole 10 of each insert 7 is shown in fig. 2. The other of the holes 10 of each insert 7 is situated in the interior of slot 8 because insert 7 has been placed into slot 8. Locking pin 5 further extends through holes 10 in the interior of slot 8.

**[0020]** Also arranged in the wall of cassette 4 are receiving parts 11 in which coupling pieces 12 are arranged. Coupling pieces 12 comprise a central ring or plate 13 and a tipped pin or bush 14 on either end, wherein in the view of fig. 2 one of the pins 14 is inserted with a tip on the outer end thereof into receiving part 11 of fig. 3. Ring 13, which can likewise take the form of a plate, for instance of plastic, ensures that pontoons 1 are held at a distance relative to each other, and can comprise a material which is to some extent compressible and elastically deformable. It is substantially the thickness of ring 13 which determines the separating distance between adjacent pontoons. Inserts 7 can at the same time be dimensioned so as to have a suitable distance between the holes 10 therein, so that adjacent pontoons 1 are held at a desired distance from each other. Because inserts 7 can rotate about locking pins 5, it would be possible for such an intermediate distance between adjacent pontoons 1 to be reduced to zero if inserts 7 rotate about locking pins 5. This is an undesirable situation, wherein coupling pieces 12 serve to prevent such a rotation. Coupling pieces 12 thus also serve as fixing means.

**[0021]** Fig. 4 shows the individual components and assembly steps, wherein reference can be made to the foregoing description for a further explanation thereof.

**[0022]** After examination of the foregoing many alternative and additional embodiments will occur to the skilled person, which will then not be a protected embodiment of the present invention only when these additional or alternative embodiments depart from the letter or spirit of the definitions of the invention in the claims. It may thus be possible to arrange a bush of for instance plastic in receiving part 11 for the purpose of placing coupling piece 12 therein in order to minimize friction between coupling piece 12 and an inner edge of receiving part 11. Holes encircling passage 9 can also be covered with a plastic material for the purpose of protecting locking pins 5 and cassettes 4.

**[0023]** Although specific reference is made in the foregoing to cassettes, the present invention is not limited thereto. Even without individual cassettes which may or may not be integrated, the present invention can be realized in long and short sides of pontoons, and cassettes or other integrated options need not necessarily be recessed so as to be flush with the long and short sides 2, 3 of pontoons 1.

## Claims

1. System for coupling at least two pontoons (1), the system comprising at least one coupling for mutually coupling two pontoons at a time, for which purpose the coupling can be placed between sides (2, 3) of the two pontoons (1) which are adjacent in the coupled situation, and comprising a substantially vertically extending passage (9) for receiving a locking pin (5) therein, and comprising at least one slot (8) transversely of the passage (9) for the locking pin (5) and at least one insert (7) for placing in the slot (8), and with a hole (10) for receiving the locking pin (5), wherein the slot (8) has, at least in the direction transversely of the passage (9), larger dimensions than a part of the insert (7) to be introduced into the slot (8). 15
2. System as claimed in claim 1, wherein the coupling is arranged between the outer ends of the sides (2, 3). 20
3. System as claimed in at least one of the foregoing claims, wherein the coupling comprises a cassette (4). 25
4. System as claimed in claim 3, wherein the cassette (4) is integrated into at least one of the two pontoons (1). 30
5. System as claimed in claim 3 or 4, wherein a cassette (4) is arranged in, on top of or on each of the two pontoons (1). 35
6. System as claimed in at least claim 1, wherein the insert (7) has a substantially figure eight-shaped outer peripheral form. 40
7. System as claimed in claims 1 and 6, wherein the hole (10) has a size closely corresponding to the dimensions of locking pin (5). 45
8. System as claimed in at least one of the foregoing claims, wherein at least one of the sides (2, 3) of at least one of the two pontoons (1) comprises a receiving part (11) for introducing a coupling piece (12) therein. 50

9. System as claimed in claim 8, wherein the coupling piece (12) comprises a spacer (13) to be arranged close to the locking pin (5) for the purpose of holding the two pontoons (1) at a mutual distance. 55
10. System as claimed in claim 9, wherein the spacer (13) comprises a ring-like or plate-like element.
11. System as claimed in claim 8, 9 or 10, wherein the coupling piece (12) comprises an aligning element. 60
12. System as claimed in claim 11, wherein the aligning element comprises a tipped member (14) such as a bush or rod. 65

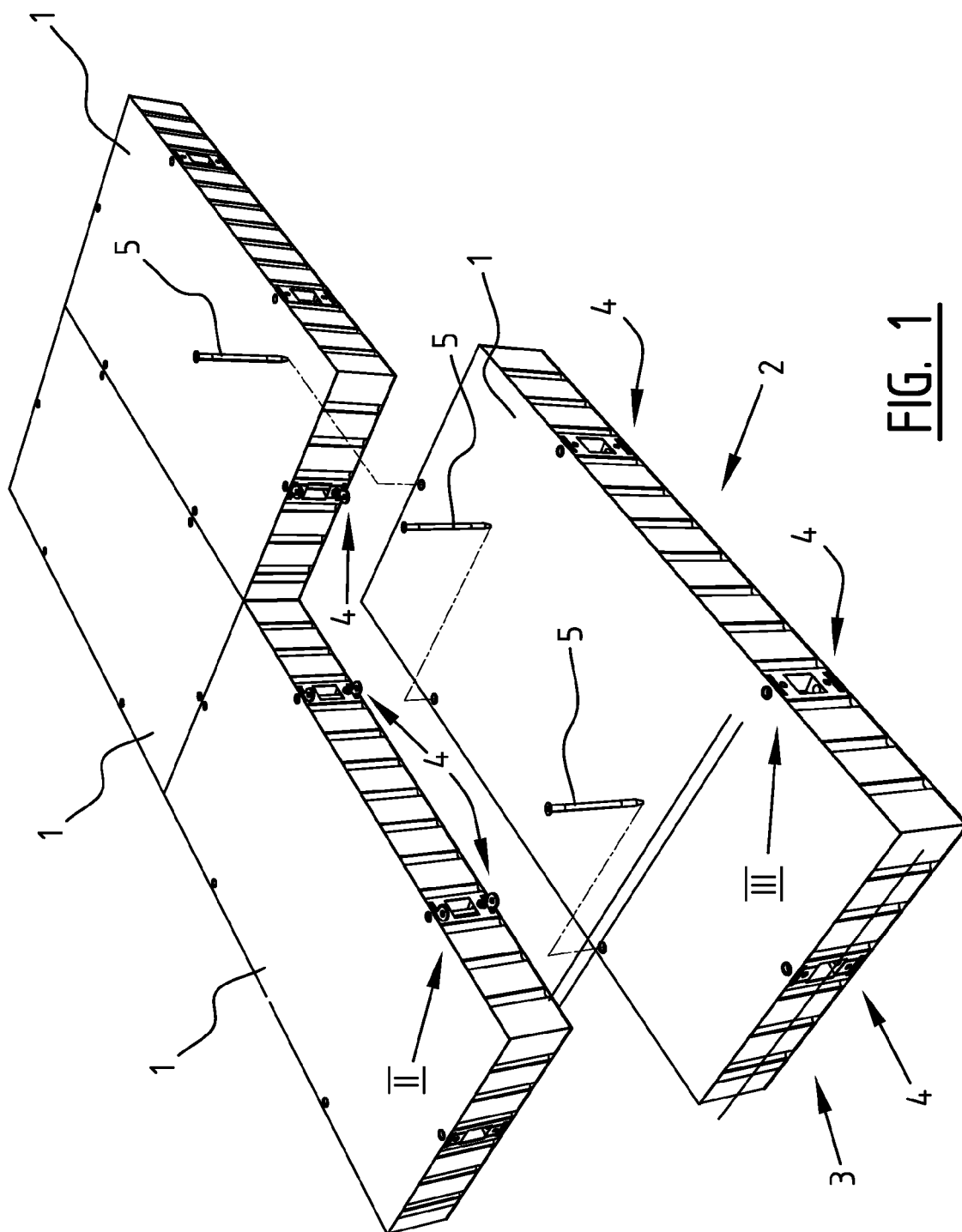
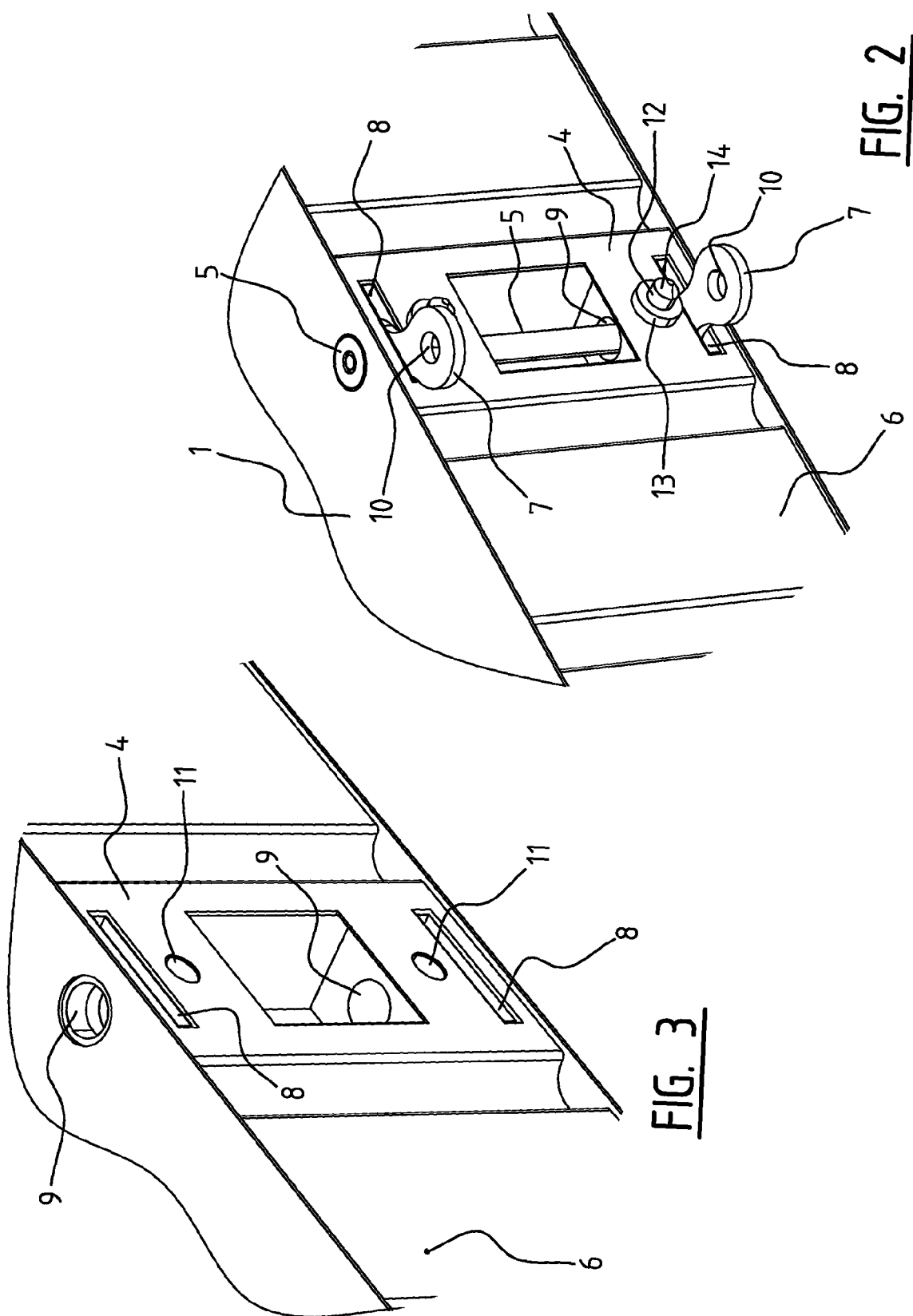
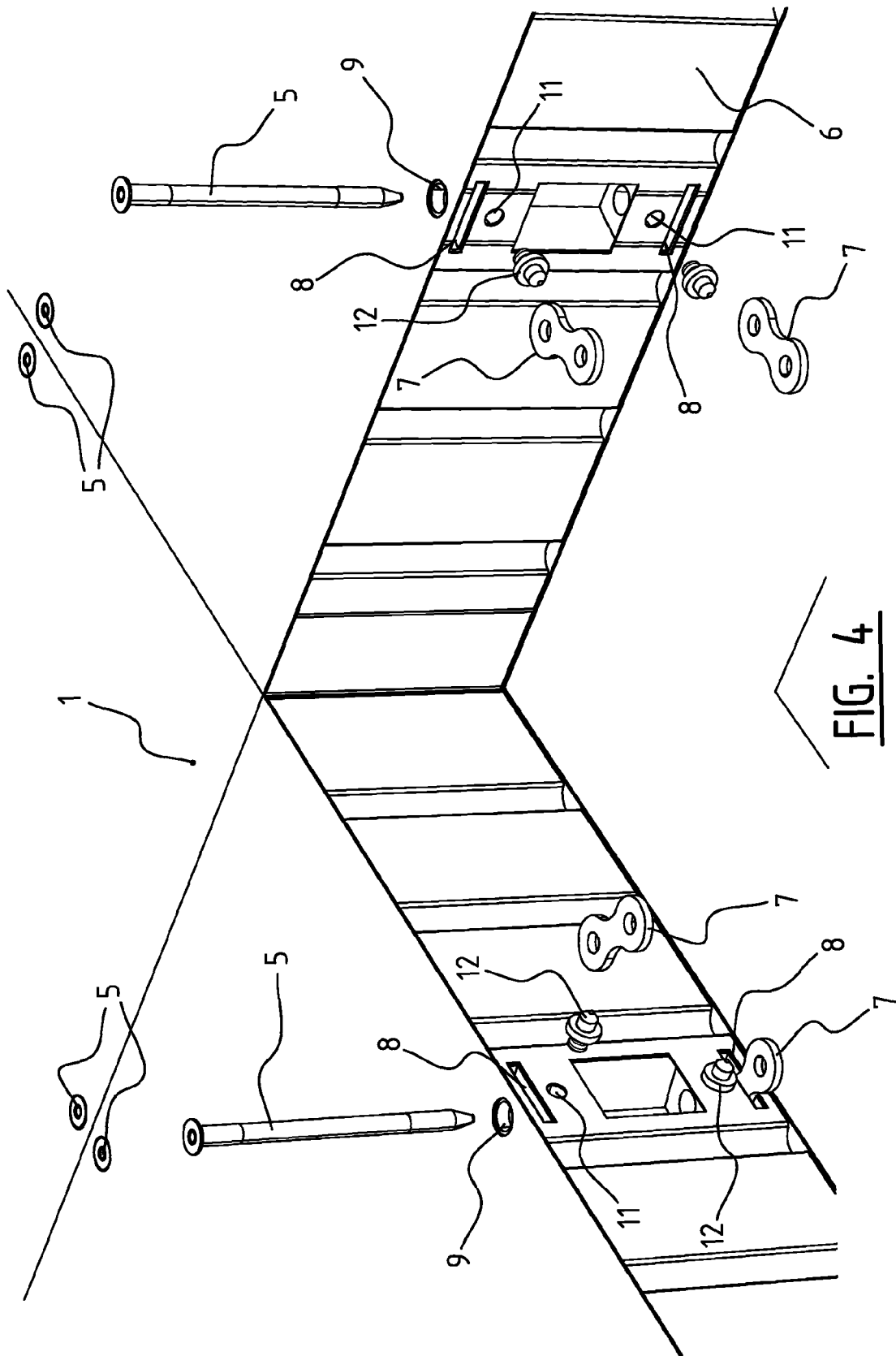


FIG. 1





**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

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- WO 2007084074 A [0005]
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