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(54) **System for coupling pontoons**

System zum Koppeln von Stegkörpern

Système de couplage de flotteurs

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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 which constitutes the closest prior art in which such a system is disclosed. The disclosure of this publication is acknowledged to constitute the closest prior art relative to which the present invention is distinguished in at least the features in the characterizing portion thereof.

[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 acknowledged prior art system by at least the features in the characterizing portion of the single appended independent claim. 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 pon-

toons 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 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 two pontoons when provided (1) which are adjacent in the coupled situation, and comprising:

   - a locking pin (5);
   - a substantially vertically extending passage (9) for receiving the locking pin (5) therein,
   - 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) ,

   characterized in that

   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) , wherein, with the locking pin (5) received in the passage (9) and in the hole (10) of the insert (7) , the locking pin holds the insert (7) in place in the slot and the insert (7) is rotatable around the locking pin (5) .

2. System as claimed in claim 1, wherein the coupling is arranged between the outer ends of the sides (2, 3).

3. System as claimed in at least one of the foregoing claims, wherein the coupling comprises a cassette (4).

4. System as claimed in claim 3, wherein the cassette (4) is integrated into at least one of the two pontoons (1).

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).

6. System as claimed in at least claim 1, wherein the insert (7) has a substantially figure eight-shaped outer peripheral form.

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).

8. System as claimed in at least one of the foregoing claims, wherein at least one side of the coupling in one of the sides (2, 3) of at least one of two pontoons (1) when provided comprises a receiving part (11) for introducing a coupling piece (12) therein.

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.

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.

12. System as claimed in claim 11, wherein the aligning element comprises a tipped member (14) such as a bush or rod.

Patentansprüche

1. System zum Koppeln von wenigstens zwei Pontons (1), wobei das System wenigstens eine Kopplung zum gegenseitigen Koppeln jeweils zweier Pontons umfasst, für welchen Zweck die Kopplung zwischen zwei Seitenflächen (2, 3) der zwei Pontons (1), wenn vorgesehen, platziert sein kann, die im gekoppelten Zustand aneinander angrenzen, und umfassend:

   - einen Verriegelungsstift (5);
   - eine sich im Wesentlichen vertikal erstreckende Passage (9) zum Aufnehmen des Verriegelungsstiftes (5) darin,
   - wenigstens einen Schlitz (8) quer zu der Passage (9) für den Verriegelungsstift (5); und
   - wenigstens einen Einsatz (7) zum Plazieren in dem Schlitz (8) , und mit einer Ausnehmung (10) zum Aufnehmen des Verriegelungsstiftes (5) ,

   dadurch gekennzeichnet, dass

   der Schlitz (8) wenigstens in Richtung quer zu der Passage (9) größere Abmessungen umfasst als ein Teil des Einsatzes (7) , der in den Schlitz (8) eingeführt werden soll, wobei, wenn der Verriegelungsstift (5) in der Passage (9) und in der Ausnehmung (10) des Einsatzes (7) aufgenommen ist, der Verriegelungsstift den Einsatz (7) im Schlitz in Position hält und der Einsatz (7) um den Verriegelungsstift (5) verdrehbar ist.

2. System gemäß Anspruch 1, bei dem die Kopplung zwischen den äußeren Enden der Seitenflächen (2, 3) angeordnet ist.

3. System gemäß wenigstens einem der vorstehenden Ansprüche, bei dem die Kopplung eine Kassette (4) umfasst.

4. System gemäß Anspruch 3, bei dem die Kassette (4) in wenigstens einem der zwei Pontons (1) integriert ist.

5. System gemäß Anspruch 3 oder 4, bei dem eine Kassette (4) in, auf oder an jedem der zwei Pontons (1) angeordnet ist.

6. System gemäß wenigstens Anspruch 1, bei dem der Einsatz (7) eine im Wesentlichen achtförmige äußere Umfangsform aufweist.

7. System gemäß Anspruch 1 und 6, bei dem die Ausnehmung (10) eine Größe aufweist, die nahe mit den Abmessungen des Verriegelungsstiftes (5) korrespondiert.

8. System gemäß wenigstens einem der vorstehenden Ansprüche, bei dem wenigstens eine Seite von der Kopplung in einer von den Seitenflächen (2, 3) von wenigstens einem der zwei Pontons (1), wenn vorgesehen, ein Aufnahmeteil (11) zum Einführen von einem Kopplungsstück (12) darin umfasst.

9. System gemäß Anspruch 8, bei dem das Kopplungsstück (12) einen Abstandshalter (13) umfasst, um nahe zu dem Verriegelungsstift (5) zum Zwecke eines Haltens der zwei Pontons (1) in einer gegenseitigen Entfernung angeordnet zu sein

10. System gemäß Anspruch 9, bei dem der Abstandshalter (13) ein ringförmiges oder plattenförmiges Element umfasst.

11. System gemäß Anspruch 8, 9 oder 10, bei dem das Kopplungsstück (12) ein Ausrichtelement umfasst.

12. System gemäß Anspruch 11, bei dem das Ausrichtelement ein mit einer Spitze versehenes Element (14), wie zum Beispiel eine Buchse oder eine Stange, umfasst.

Revendications

1. Système de couplage d'au moins deux pontons (1) au moins, le système comprenant au moins un couplage destiné à coupler mutuellement deux pontons à la fois, dont le but est de pouvoir placer le couplage entre les côtés (2, 3) de deux pontons (1), lorsque cela est prévu, qui sont adjacents dans la situation couplée, et comprenant :

- une broche de verrouillage (5) ;
- un passage s'étendant de manière sensiblement verticale (9) destiné à recevoir à l'intérieur la broche de verrouillage (5) ;
- au moins une fente (8) disposée de manière transversale par rapport au passage (9) de la broche de verrouillage (5) ; et
- au moins une pièce rapportée (7) destinée à être placée dans la fente (8), et muni d'un trou (10) destiné à recevoir la broche de verrouillage (5) ;

caractérisé en ce que

la fente (8) présente, au moins dans le sens transversal par rapport au passage (9), des dimensions plus importantes que celles d'une partie de la pièce rapportée (7) à introduire dans la fente (8), dans lequel, lorsque la broche de verrouillage (5) est reçue dans le passage (9) et dans le trou (10) de la pièce rapportée (7), la broche de verrouillage maintient en place la pièce rapportée (7) dans la fente et la pièce rapportée (7) peut tourner autour de la broche de verrouillage (5).

2. Système selon la revendication 1, dans lequel le couplage est agencé entre les extrémités extérieures des côtés (2, 3) .

3. Système selon au moins l'une quelconque des revendications précédentes, dans lequel le couplage comprend une cassette (4).

4. Système selon la revendication 3, dans lequel la cassette (4) est intégrée dans l'au moins un des deux pontons (1).

5. Système selon la revendication 3 ou 4, dans lequel une cassette (4) est agencée dans, au sommet ou sur chacun des deux pontons (1).

6. Système selon au moins la revendication 1, dans lequel la pièce rapportée (7) présente une forme périphérique extérieure sensiblement en forme de chiffre huit.

7. Système selon les revendications 1 et 6, dans lequel le trou (10) présente une taille qui se rapproche des dimensions de la broche de verrouillage (5).

8. Système selon au moins l'une quelconque des revendications précédentes, dans lequel au moins un côté du couplage sur l'un des côtés (2, 3) d'au moins un des deux pontons (1), lorsque cela est prévu, comprend une partie de réception (11) destinée à introduire à l'intérieur une pièce de couplage (12).

9. Système selon la revendication 8, dans lequel la pièce de couplage (12) comprend une entretoise (13) à agencer à proximité de la broche de verrouillage (5) dans le but de tenir les deux pontons (1) à une distance mutuelle.

10. Système selon la revendication 9, dans lequel l'entretoise (13) comprend un élément en forme de bague ou de plaque.

11. Système selon les revendications 8, 9 ou 10, dans lequel la pièce de couplage (12) comprend un élément d'alignement.

12. Système selon la revendication 11, dans lequel l'élément d'alignement comprend un élément incliné (14) tel qu'un manchon ou une tige.

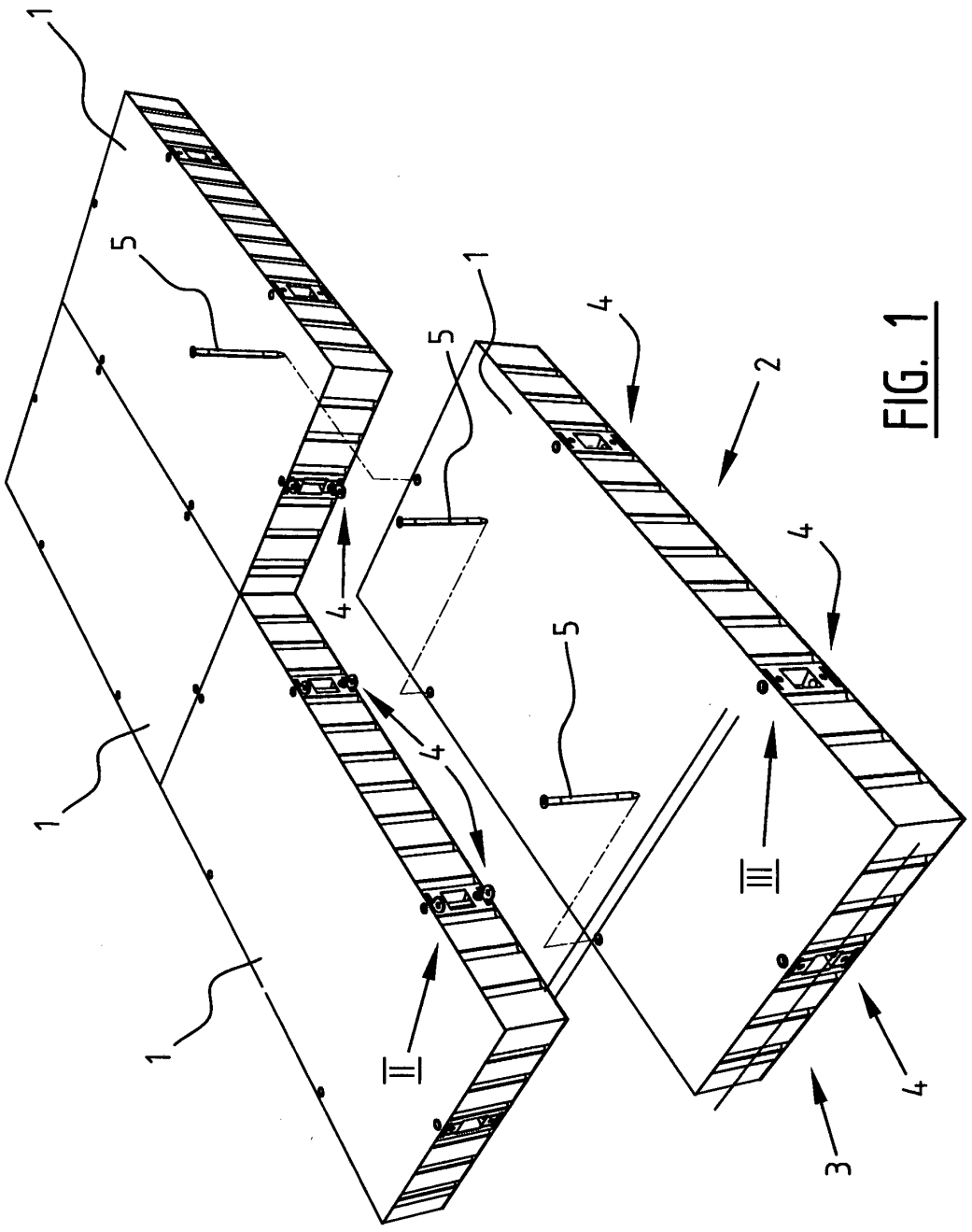

FIG. 1

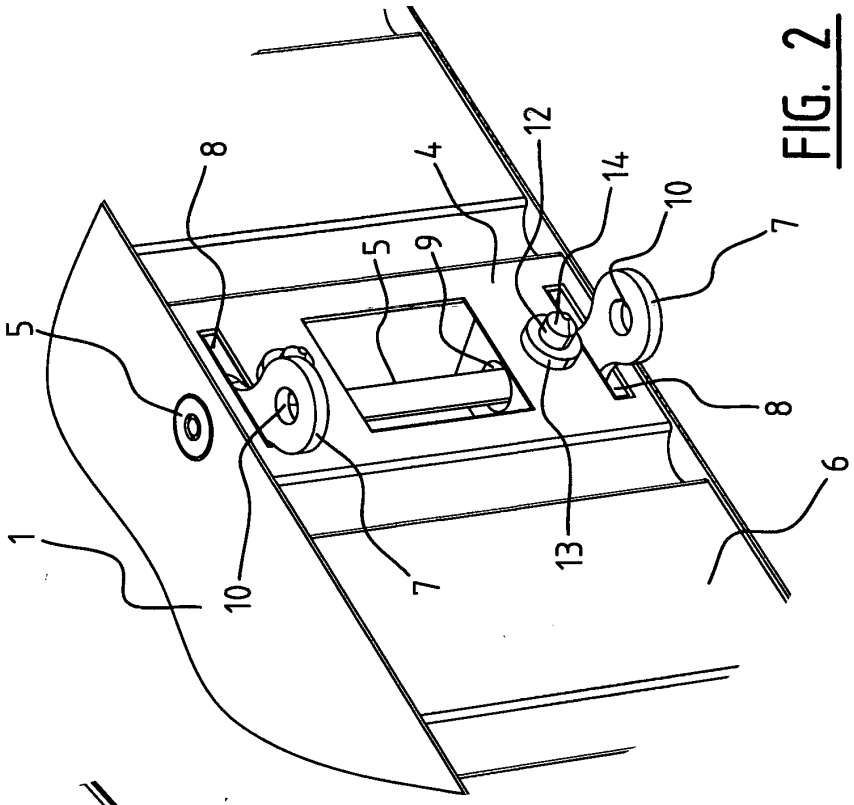

FIG. 2

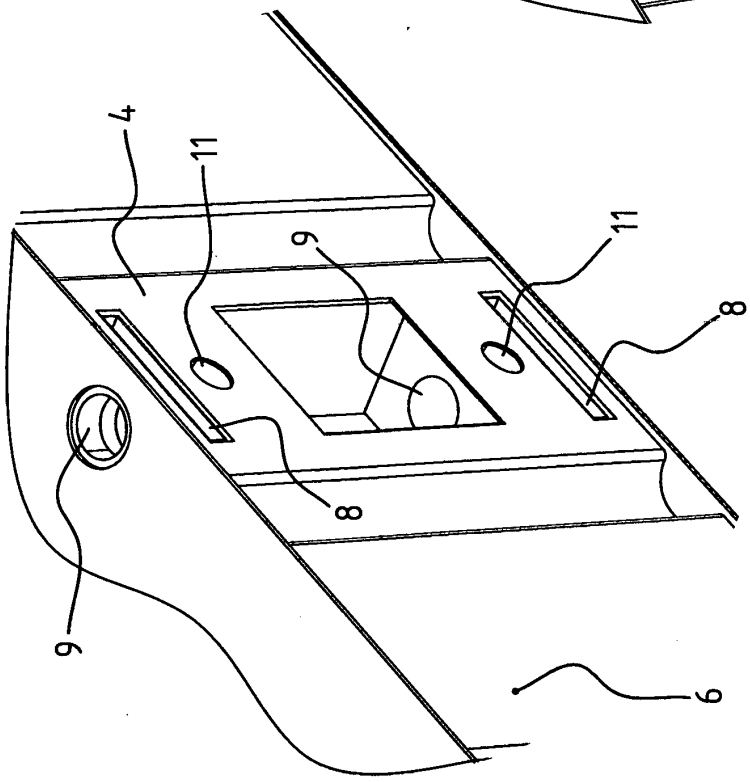

FIG. 3

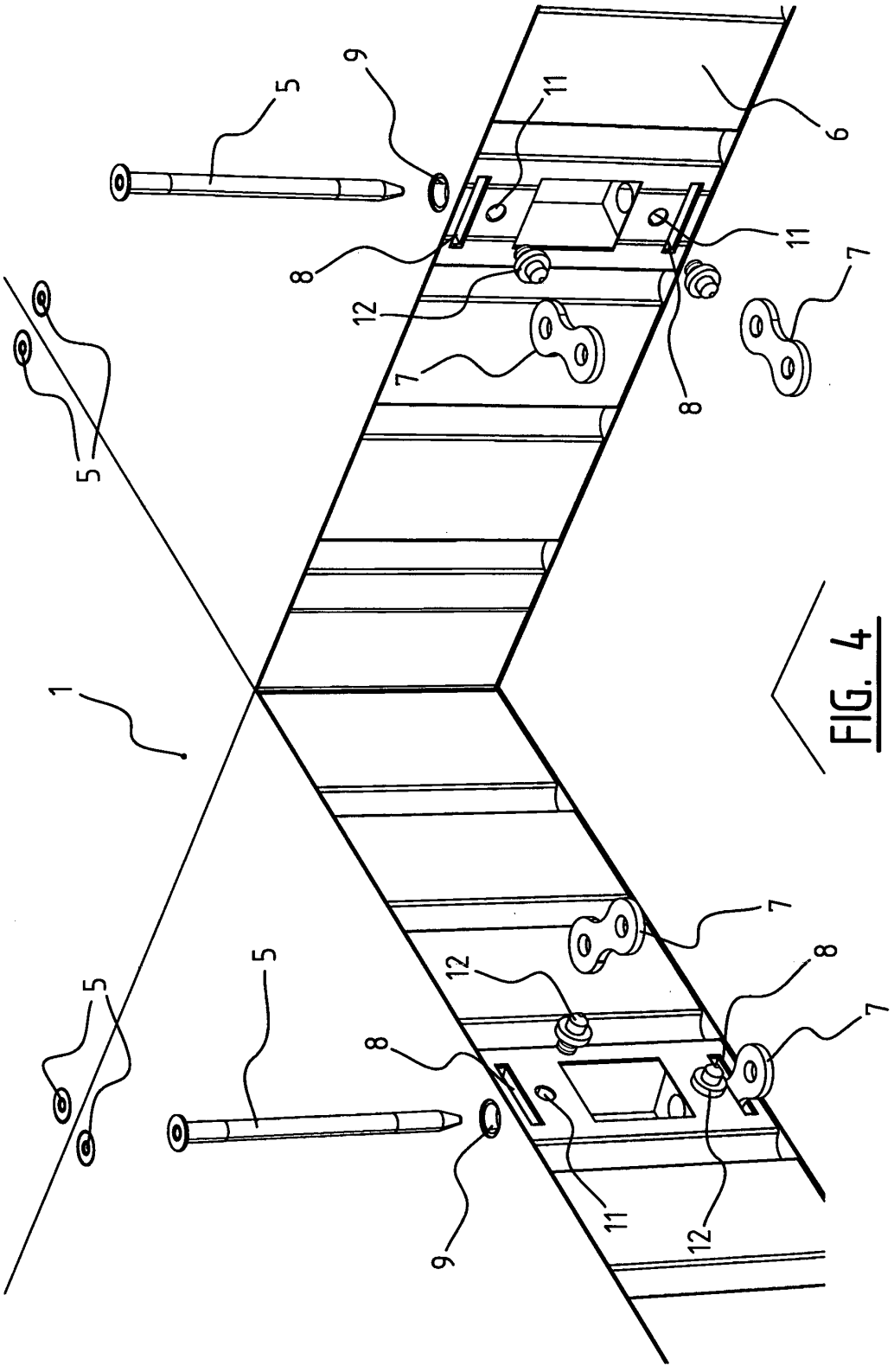

FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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