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(54) **ANTI-FLOOD DEVICE**

HOCHWASSERBARRIERE

BARRIÈRE ANTI-INONDATION

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(56) References cited:  
**EP-A2- 2 703 563 CN-B- 107 120 051**  
**GB-A- 2 243 393 GB-A- 2 327 697**  
**GB-A- 2 567 688 US-B1- 7 523 589**

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## Description

**[0001]** The present invention relates to an anti-flood device. In particular, the present invention regards an anti-flood device prearranged for isolating buildings from water. In greater detail, the present invention regards an anti-flood device prearranged for isolating buildings from water using at least one mobile flood barrier.

### DESCRIPTION OF THE PRIOR ART

**[0002]** When a building is erected in areas where there is a risk of water courses or canals overflowing, the openings at ground-floor level for doors or windows are normally provided with guides for mobile flood barriers, usually having a rectangular shape, which are normally stored in the cellar or basement, and, in the case of danger of flooding, are positioned between the guides. It is readily understandable that the weight of the flood barrier and the type of coupling of the flood barrier with the guides and with the floor portion set between the guides determines the quality of hydraulic sealing. The greater the pressure of contact of the sides of the flood barrier with the guides and the base of the flood barrier with the floor portion, the greater the quality of the hydraulic sealing ensured globally by the flood barrier itself.

**[0003]** It may be readily understood that the hydraulic sealing is further improved by the use of pressure members that force contact between the sides of the flood barrier and the guides and between the base of the flood barrier and the floor portion.

**[0004]** On the other hand, it may well be understood that the simple force of gravity is not sufficient to hold the flood barrier in place downwards. As a result, to strengthen the connection between the flood barrier and the guides, in addition to providing each side of the flood barrier with respective strips of deformable elastomeric material laterally and in the base portion against the floor, normally the guides are equipped with brackets, and so also the flood barrier, which as far as possible are set facing one another and possibly in mutual contact when the flood barrier is installed; the brackets are connected through via padlocks so as to prevent relative deviation due to floating of the flood barrier between the guides or limit any transverse play and relative seepage that are even so present.

**[0005]** To limit these problems it is possible to use wedge-shaped members that are interposed in the gaps between the sides of the flood barrier and the guides so as to minimize the risk of front seepage, and devices are used designed to exert pressure downwards on the flood barrier to limit the risk of seepage between the base of the flood barrier and the floor.

**[0006]** From the foregoing, it is readily understandable that the application of the above wedge-shaped elements completes installation of the flood barrier between the guides but requires an additional time for installing each wedge-shaped element and is all the more effective, the

greater the force of contact achieved between the matching surfaces, and consequently, the greater the energy exerted on the wedge-shaped elements by the operator. On the other hand, considering that the brackets do not generally manage to determine a condition of total stability of installation of the flood barrier between the guides, in the case of wave motion release of the wedge-shaped elements is likely to occur, with the consequence that the flood barrier can assume positions different from the one that ensures hydraulic sealing with the bottom or with the guides, causing formation of gaps and, consequently, bringing about seepage.

**[0007]** From the foregoing, the problem of having available an anti-flood device that is hydraulically effective and practical in use is currently unsolved and represents an interesting challenge for the present applicant.

**[0008]** Considering the situation described above it would be desirable to have available an anti-flood device that, in addition to making it possible to limit and possibly overcome the drawbacks typical of the prior art illustrated above, will define a new standard for these types of device that will be easy to install at the base of each opening exposed to the risk of penetration of flood water or the like. Examples of anti-flood devices according to the prior art are known from EP 2703563, US 7523589, GB 2243393, CN 107120051.

### SUMMARY OF THE PRESENT INVENTION

**[0009]** The present invention relates to an anti-flood device.

**[0010]** In particular, the present invention regards an anti-flood device prearranged for isolating buildings from water. In greater detail, the present invention regards an anti-flood device prearranged for isolating buildings from water using at least one mobile flood barrier.

**[0011]** The problems set forth above are solved by the present invention according to at least one of the ensuing claims. According to some embodiments of the present invention, an anti-flood device is provided, which comprises: a frame provided with a pair of lateral contrast elements that extend in a given direction starting from a base in contact with a floor and are set facing each other, each said contrast element having a longitudinal abutment, the two said abutments identifying a reference plane developing in said given direction; a flood barrier delimited laterally by two sides shaped being set up against said abutments; and a bottom edge shaped for coupling with said floor between said contrast elements, elastic sealing means being arranged longitudinally between each said abutment and each said edge for coupling said flood barrier and said contrast elements at the front in a hydraulically sealed manner, sealing means being arranged between said flood barrier and said floor to exert a sealing action at the level of said bottom edge, attachment means being carried by said contrast elements for holding said flood barrier at the front against the countering action of said elastic sealing means, the

anti-flood device additionally comprising the further features as recited in claim 1.

**[0012]** In some embodiments of the present invention, the aforesaid attachment means comprise a pin for each of said bases, which is brought up against said abutment to delimit a space, the depth of which approximates a thickness of the corresponding side of said flood barrier.

**[0013]** According to a possible variant embodiment of the present invention, safety means are provided designed to block said sides of said flood barrier against said abutments and said edge against said floor.

**[0014]** In certain cases, each of said sides is delimited at the top by a hollow portion, which houses a roller carried in a rotatable manner in a direction transverse to said direction; each said contrast element being delimited at the top by a head piece having a width greater than the thickness of said flood barrier and having thrust means designed to press said flood barrier towards said floor.

**[0015]** In other cases, said thrust means comprise a substantially cylindrical central seat for said roller and a front portion for attachment of said head piece having a thickness that increases in the direction of said seat.

**[0016]** According to a possible variant embodiment of the present invention, said safety means comprise at least one latch carried at the top by said flood barrier in a position corresponding to said side so that it faces the respective said head piece, the bolt of the latch being mobile between a neutral position where it does not project beyond said flood barrier and an operative position where it partially projects with respect to said flood barrier and interferes with said corresponding head piece in a respective housing.

**[0017]** In some cases, the aforesaid edge is convex and V-shaped; a sectional bar with V-shaped section being provided between said bases of said contrast elements at the level of said floor and being provided with a concave portion prearranged for housing said edge in a hydraulically sealed manner.

**[0018]** In other cases, a strip of elastomeric material is provided between said bar and said edge.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0019]** Further characteristics and advantages of the anti-flood device according to the present invention will emerge more clearly from the ensuing description, provided with reference to the attached drawings, which illustrate some non-limiting examples of embodiment thereof and in which identical or corresponding parts of the device itself are designated by the same reference numbers. In particular:

- Figure 1 is a view in front elevation of an anti-flood device according to the present invention set installed in a first operating condition;
- Figure 2 is a first detail drawn from Figure 1 and represented on an enlarged scale;

- Figure 3 is a plan view of the detail of Figure 2;
- Figure 4 is a view on an enlarged scale of a second detail drawn from Figure 1 in a second operating condition;
- 5 - Figure 5 is a rear view of the device of Figure 1;
- Figure 6 illustrates a detail of Figure 5 on an enlarged scale and with parts removed for the sake of clarity;
- Figure 7 illustrates the detail of Figure 5 with parts removed for the sake of clarity;
- 10 - Figure 8 shows what is represented in Figure 7 on an enlarged scale and with parts removed for the sake of clarity;
- Figure 9 is a plan view of the device of Figure 1 in a third operating condition;
- 15 - Figure 10 is a schematic perspective side view of a top portion of what is represented in Figure 9;
- Figure 11 shows what is represented in Figure 10 in top plan view, with parts removed for the sake of clarity;
- 20 - Figure 12 is a side view of Figure 11;
- Figure 13 is a cross-sectional view of a detail of Figure 12 on an enlarged scale;
- Figure 14 is a view of a top lateral portion of Figure 1 sectioned with a vertical and transverse plane of Figure 1, represented on an enlarged scale and with parts removed for the sake of clarity;
- 25 - Figure 15 is a longitudinal sectional view of what is represented in Figure 14;
- Figure 16 is a view in a horizontal plane of a lateral portion of the device represented in Figure 1 on an enlarged scale and with parts removed for the sake of clarity; and
- 30 - Figure 17 is a schematic view in front elevation of a variant of Figure 1.

#### DETAILED DESCRIPTION OF THE PRESENT INVENTION

**[0020]** In Figure 1, designated as a whole by 1 is an anti-flood device. Once again with reference to Figure 1, the device 1 comprises a frame 10 provided with a pair of lateral contrast elements 12, 12' applied to the side edges B of an opening A of a known building, where said lateral contrast elements 12, 12' extend in a given direction D starting from a base 14, 14' set in substantial contact with a floor P. It is worthwhile pointing out that the floor P is illustrated in the attached figures as a box-shaped body having a flattened rectangular section, without thereby conditioning the scope of the present invention as defined by the appended claims.

**[0021]** The two contrast elements 12 and 12' are obtained with two sectional bodies having an L section.

**[0022]** The two contrast elements 12 and 12' are set facing one another, and each of them has a plane and longitudinal abutment 120, 120', set at the front in Figures 1-4. The two abutments 120, 120' identify as a whole a reference plane M (Figure 3), which is internally tangential to the abutments 120 and 120' and develops accord-

ing to the given direction D. The device 1 further comprises a flood barrier 20, which is laterally delimited by two sides 22, 22', shaped being set up against the abutments 120, 120', and a bottom edge 24. Said bottom edge 24 is shaped for coupling with the floor P between the contrast elements 12, 12' and can have a cross section shaped in a substantially rectangular or semi-circular manner, or having a V-shape, according to the conformation of the floor P between the two contrast elements 12 and 12'. In the version of the flood barrier 20 illustrated in the attached figures, the edge 24 is rectangular, without this in any way limiting the scope of the present invention as defined by the appended claims.

**[0023]** With particular reference to Figures 9-12, the device 1 comprises elastic sealing members 30, which are arranged longitudinally between each abutment 120, 120' and each edge 22, 22' for coupling at the front the flood barrier 20 and the contrast elements 12, 12' in a hydraulically sealed manner. With particular reference to Figures 1 and 2, the flood barrier 20 has a sealing element 40 constituted by a strip of elastomeric material, which, for practical reasons is designated by the same reference number 40 and has the purpose of exerting a sealing action at the level of the bottom edge 24. In actual fact, this strip 40 must necessarily be set at the interface between the flood barrier 20 and the floor P to exert its own hydraulic sealing action at the base of the flood barrier 20, so that falling within the scope of the present invention is also the version of the device 1 in which said strip 40 is applied to the floor P at the moment of installation of the device 1 itself.

**[0024]** The device 1 further comprises engagement members 50, which are carried by the contrast elements 12, 12' for holding the flood barrier 20 at the front against the countering action of the elastic sealing means 30. The engagement members 50 comprise a pin 52 for each base 14, where said pin is carried parallel to and longitudinally facing the respective abutment 120/120' for delimiting, together with the latter, a space, the depth of which locally approximates the thickness of the corresponding side 22, 22' of the flood barrier 20.

**[0025]** Each side 22, 22' of the flood barrier 20 is delimited at the top by a hollow portion 220, 220', which houses a roller 222/222', rotatably carried in a direction transverse to the direction D. Each contrast element 12, 12' is delimited at the top by a head piece 122, 122', the width of which is greater than a thickness of the flood barrier 20. Each head piece 122/122' (Figure 13) has thrust members 1220, 1220' designed to press the flood barrier against the floor P. These thrust members 1220/1220' are designed to act by shape fitting and, in particular, they comprise a substantially cylindrical central seat 1222, 1222' for the roller 222, 222' and a front portion 1224, 1224', which is provided for attachment of the head piece 122, 122' and has a thickness that increases in the direction of the seat 1220, 1220', and is hence shaped like an inclined plane.

**[0026]** With particular reference to Figures 1-4, the de-

vice 1 comprises safety members 60 designed to block the sides 22, 22' of the flood barrier 20 against the abutments 120, 120' and, at the same time, the edge 24 against the floor P. In particular, the safety members 60 comprise a latch 62 for each side of the flood barrier 20, where each latch is carried at the top by the flood barrier 20 in a position facing the respective head piece 122, 122' with the bolt mobile between a neutral position where it does not project beyond the flood barrier 20 and an operative position where it partially projects with respect to the flood barrier 20 and interferes with the corresponding head piece 122, 122' in a respective housing 1226, 1226'.

**[0027]** For practical reasons, at least one handle 80 is applied to the flood barrier; in Figure 1, the handle 80 is single, given the small dimensions of the flood barrier 20 that used as model for illustrating the structural characteristics of the present invention.

**[0028]** Use of the device 1 can be readily understood and does not require any further explanations. On the other hand, it is to be pointed out that installation of the flood barrier 20 between the contrast elements 12 and 12' is obtained easily using any handle 80 that makes it possible to support the flood barrier 20 and move it until it is set with its edge 24 between the contrast elements inside the space delimited by the abutments 120 and 120' and by the pins 52. In this position, visible in Figure 9, the flood barrier 20 is inclined, and the handle 80 makes it possible to support it, with the rollers 222 and 222' facing the head pieces 122 and 122'. In this operative condition, the flood barrier 20 is arranged neatly with the sides 22 and 22' inclined with respect to the contrast elements 12 and 12', and the handle 80 can be used to turn the flood barrier 20 itself in the clockwise direction as viewed in Figure 10, after it has been brought into contact with the front portion 1222/1222' of each head piece 122/122'. The freedom of rotation of the rollers 222 and 222' with respect to the corresponding pin 2220/2220' (visible in Figure 15), combined with the elasticity of the strip 40 of elastomeric material, enables the flood barrier 20 to be pushed downwards during the clockwise rotation referred to above and be held in a position of compression against the floor P even when the roller stably engages the seat 1220, 1220' of the respective head piece 122/122', thus bringing about a stable operating condition for the flood barrier 20. Use of the latches 62 enables definitive stabilization of this operating condition, which - it may be pointed out - has been brought about by exerting an action of pressure sufficient to overcome the elastic resistance of the elastic sealing members 30, which are in fact arranged longitudinally between each abutment 120, 120' and each edge 22, 22', with the effect of coupling at the front the flood barrier 20 and the sealing contrast elements 12, 12'.

**[0029]** Finally, it is clear that modifications and variations may be made to the device 1 described and illustrated herein, without thereby departing from the scope of the present invention as defined by the appended

claims. For instance, it is worthwhile pointing out that, in the case where the edge 24 is convex and V-shaped, it is advisable to make a furrow in the floor P between the bases 14, 14' of the contrast elements 12, 12', where said furrow has a shape matching the edge 24 or, even better, designed to house a sectional bar with V-shaped section provided, in turn, with a concave portion prearranged for housing the edge 24 in a matching manner at least along a line in order to ensure hydraulic sealing with the floor P. What has been said with reference to the furrow and to the bar is readily understandable and does not require the support of a graphic representation, which is omitted for economy of illustration.

**[0030]** Of course, the anti-flood device 1 can be used not only to prevent entry of water through the openings (doors or windows) of a building, by providing sealed stretches in combination with the side edges B and the respective floor portions P, but also to prevent access of liquids into subways, tunnels, or underground passages, which are provided with parallel sides or sides rendered such at least for the vertical extension of the flood barriers used.

**[0031]** Figure 17 illustrates an opening A particularly extensive in width. In this case, the flow of the liquid to be stopped could be particularly significant, both in terms of mass and in terms of power associated with the incoming mass of liquid. For this reason, it may be convenient to counter deflection of the flood barrier 20, and the consequent loss of effectiveness of the anti-flood device 1 as a whole, equipping the device 1 with an anti-deflection unit 90 comprising a plurality of vertical latches 91 distributed at the bottom along the flood barrier 20 and provided with bolts 92 mobile in a vertical direction selectively between a neutral position and a position of engagement of a hole 94, made in the floor P in front of or behind the projection on the ground of the flood barrier 20. Each hole 94 houses a bushing 96 of a known type, vertically accessible by a bolt 92 but normally closed by a base (known and not illustrated) mobile vertically towards the bottom of the bushing 96 following upon displacement of the respective bolt 92 from a neutral position to a position of engagement against the thrust of a spring, known and not illustrated. It may well be understood that the purpose of the mobile base of each bushing 96 is to prevent intrusion of dirt or obstructing bodies into the bushing 96 itself.

**[0032]** According to what has been described above, it may be readily understood that the anti-flood device 1 can be validly used for overcoming the drawbacks of the prior art illustrated above in a simple and inexpensive manner, thanks to the structural characteristics described above, which can be modified, without thereby departing from the scope of the present invention as defined by the appended claims.

## Claims

1. An anti-flood device (1) comprising a frame (10) provided with a pair of lateral contrast elements (12, 12'), which are elongated in a given direction (D) starting from a base (14, 14') in contact with a floor (P) and are mutually facing each other, each said contrast element (12, 12') having a longitudinal abutment (120, 120'), the two said abutments (120, 120') identifying a reference plane (M) developed according to said given direction (D); and a flood barrier (20) laterally delimited by two sides (22, 22') shaped to be facing said abutments (120, 120') and a bottom edge (24) shaped for coupling with said floor (P) between said contrast elements (12, 12'); elastic sealing means (30) being arranged longitudinally between each said abutment (120, 120') and each said edge (22, 22') for coupling said flood barrier (20) at the front and said contrast elements (12, 12') in a hydraulically sealed manner, sealing means (40) being arranged between said flood barrier (20) and said floor (P) for exerting a sealing action on said bottom edge (24), attachment means (50) being carried by said contrast elements (12, 12') for holding said flood barrier (20) at the front against the countering action of said elastic sealing means (30); **characterized in that** each said side (22, 22') is delimited at the top by a hollow portion (220, 220') that houses a roller (222, 222') carried in a rotatable manner in a direction transverse to said direction (D); each said contrast element (12, 12') being delimited at the top by a head piece (122, 122') having thrust means (1222, 1222') designed to act by shape fitting on each respective roller (222, 222') to press said flood barrier (20) against said floor (P).
2. The device according to claim 1, **characterized in that** at least a head piece (122, 122') has a width greater than said flood barrier (20); said thrust means (1222, 1222') comprise a substantially cylindrical central seat (1220, 1220') for said roller (222, 222') and a front portion (1224, 1224') for attachment of said head piece (122, 122') that has a thickness that increases in the direction of said seat (1220, 1220').
3. The device according to claim 1 or 2, **characterized in that** said attachment means (50) comprise a pin (52) for each of said bases (14) carried facing said abutment (120, 120') to delimit a space, the depth of which approximates a thickness of the corresponding side (22, 22') of said flood barrier (20).
4. The device according to any one of the preceding claims, **characterized in that** it comprises safety means (60) designed to block said sides (22, 22') of said flood barrier (20) against said abutments (120, 120') and said edge (24) against said floor (P).

5. The device according to claim 4, **characterized in that** said safety means (60) comprise at least one latch (62) carried at the top by said flood barrier (20) on said side (22, 22') in an overlooking position of the respective said head piece (122, 122') mobile between a complete overlapping neutral position with said flood barrier (20) and a partially overlapping operating position with said flood barrier (20) and an interference position with said corresponding head piece (122, 122') in a respective housing (1224, 1224').
6. The device according to any one of the preceding claims, **characterized in that** said edge (24) is convex and V-shaped, a sectional bar (70) with a V-shaped section being provided between said bases (14, 14') of said contrast elements (12, 12') of said floor (P) and having a concave portion (72) prearranged for housing said edge (24) in a hydraulically sealed manner.
7. The device according to claim 6, **characterized in that** it comprises a strip (40) of elastomeric material between said bar (70) and said edge (24).
8. The device according to any one of the preceding claims, **characterized in that** it comprises anti-deflection means (90) associated with said flood barrier (20) and provided with a plurality of latches (91) distributed along said flood barrier (20) and provided with bolts (92) designed to selectively engage a hole (94) made in said floor (P).
9. The device according to claim 8, **characterized in that** at least one said hole (94) houses a normally closed bushing (96) vertically accessible against the thrust of a spring.

#### Patentansprüche

1. Eine Hochwasserschutzvorrichtung (1), die Folgendes beinhaltet: einen Rahmen (10), der mit einem Paar lateraler Kontrastelemente (12, 12') versehen ist, die in einer gegebenen Richtung (D), angefangen von einer Basis (14, 14'), die mit einem Boden (P) in Kontakt steht, langgestreckt sind und einander zugewandt sind, wobei jedes Kontrastelement (12, 12') einen längslaufenden Anschlag (120, 120') aufweist, wobei die zwei Anschläge (120, 120') eine Bezugsebene (M) identifizieren, die gemäß der gegebenen Richtung (D) verläuft; und eine Hochwasserbarriere (20), die seitlich von zwei Seiten (22, 22'), die so geformt sind, dass sie den Anschlägen (120, 120') zugewandt sind, und von einer unteren Kante (24), die zum Koppeln mit dem Boden (P) zwischen den Kontrastelementen (12, 12') geformt ist, begrenzt ist; elastische Dichtungsmittel (30), die längslaufend

zwischen jedem Anschlag (120, 120') und jeder Kante (22, 22') zum Koppeln der Hochwasserbarriere (20) an der Vorderseite und der Kontrastelemente (12, 12') in einer hydraulisch dichten Weise angeordnet sind, Dichtungsmittel (40), die zwischen der Hochwasserbarriere (20) und dem Boden (P) zum Ausüben einer Dichtungswirkung auf die Bodenkante (24) angeordnet sind, Befestigungsmittel (50), die von den Kontrastelementen (12, 12') getragen werden, zum Halten der Hochwasserbarriere (20) an der Vorderseite gegen die Konterwirkung der elastischen Dichtungsmittel (30); **dadurch gekennzeichnet, dass** jede Seite (22, 22') an der Oberseite von einem hohlen Abschnitt (220, 220') begrenzt ist, in dem eine Rolle (222, 222') untergebracht ist, die in einer drehbaren Weise in einer zur Richtung (D) querlaufenden Richtung getragen wird; jedes Kontrastelement (12, 12') an der Oberseite von einem Kopfstück (122, 122') begrenzt ist, das Druckmittel (1222, 1222') aufweist, die ausgelegt sind, um durch Formpassung auf jede jeweilige Rolle (222, 222') die Hochwasserbarriere (20) gegen den Boden (P) zu drücken.

2. Vorrichtung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** mindestens ein Kopfstück (122, 122') eine Breite aufweist, die größer als die Hochwasserbarriere (20) ist; die Druckmittel (1222, 1222') einen im Wesentlichen zylindrischen mittigen Sitz (1220, 1220') für die Rolle (222, 222') und einen Vorderseitenabschnitt (1224, 1224') zur Befestigung des Kopfstücks (122, 122'), der eine Dicke aufweist, die in der Richtung des Sitzes (1220, 1220') zunimmt, beinhalten.
3. Vorrichtung gemäß Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Befestigungsmittel (50) einen Stift (52) für jede der Basen (14) beinhalten, der getragen wird, um dem Anschlag (120, 120') zugewandt zu sein, um einen Raum zu begrenzen, dessen Tiefe einer Dicke der entsprechenden Seite (22, 22') der Hochwasserbarriere (20) nahe kommt.
4. Vorrichtung gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sie Sicherheitsmittel (60) beinhaltet, die ausgelegt sind, um die Seiten (22, 22') der Hochwasserbarriere (20) gegen die Anschläge (120, 120') und die Kante (24) gegen den Boden (P) zu blockieren.
5. Vorrichtung gemäß Anspruch 4, **dadurch gekennzeichnet, dass** die Sicherheitsmittel (60) mindestens einen Riegel (62) beinhalten, der an der Oberseite der Hochwasserbarriere (20) auf der Seite (22, 22') in einer überschauenden Position des jeweiligen Kopfstücks (122, 122') beweglich zwischen einer vollständig überlappenden neutralen Position mit der Hochwasserbarriere (20) und einer teilweise

überlappenden Betriebsposition mit der Hochwasserbarriere (20) und einer Interferenzposition mit dem entsprechenden Kopfstück (122, 122') in einem jeweiligen Gehäuse (1224, 1224') getragen wird.

6. Vorrichtung gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Kante (24) konvex und V-förmig ist, ein Profilstab (70) mit einem V-förmigen Profil zwischen den Basen (14, 14') der Kontrastelemente (12, 12') des Bodens (P) bereitgestellt ist und einen konkaven Abschnitt (72) aufweist, der zum Unterbringen der Kante (24) in einer hydraulisch dichten Weise im Voraus angeordnet wird.
7. Vorrichtung gemäß Anspruch 6, **dadurch gekennzeichnet, dass** sie einen Streifen (40) aus elastomerem Material zwischen dem Stab (70) und der Kante (24) beinhaltet.
8. Vorrichtung gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sie Durchbiegungsschutzmittel (90) beinhaltet, die mit der Hochwasserbarriere (20) assoziiert und mit einer Vielzahl von Riegeln (91) versehen sind, die entlang der Hochwasserbarriere (20) verteilt und mit Bolzen (92), die ausgelegt sind, um ein im Boden (P) geschaffenes Loch (94) selektiv in Eingriff zu nehmen, versehen sind.
9. Vorrichtung gemäß Anspruch 8, **dadurch gekennzeichnet, dass** in mindestens einem Loch (94) eine normalerweise geschlossene Buchse (96) untergebracht ist, die vertikal gegen den Druck einer Feder zugänglich ist.

## Revendications

1. Un dispositif anti-inondation (1) comprenant un châssis (10) pourvu d'une paire d'éléments en opposition (12, 12') latéraux, qui sont allongés dans une direction (D) donnée à partir d'une base (14, 14') en contact avec un sol (P) et se font mutuellement face, chacun desdits éléments en opposition (12, 12') ayant un appui (120, 120') longitudinal, lesdits deux appuis (120, 120') identifiant un plan de référence (M) développé selon ladite direction (D) donnée ; et une barrière anti-inondation (20) délimitée latéralement par deux côtés (22, 22') formés afin de faire face auxdits appuis (120, 120') et par un bord inférieur (24) formé pour se coupler audit sol (P) entre lesdits éléments en opposition (12, 12') ; des moyens d'étanchéité élastiques (30) étant agencés longitudinalement entre chacun desdits appuis (120, 120') et chacun desdits bords (22, 22') pour coupler ladite barrière anti-inondation (20) à l'avant et lesdits éléments en opposition (12, 12') d'une ma-

nière hydrauliquement étanche, des moyens d'étanchéité (40) étant agencés entre ladite barrière anti-inondation (20) et ledit sol (P) pour exercer une action d'étanchéité sur ledit bord inférieur (24), des moyens de fixation (50) étant portés par lesdits éléments en opposition (12, 12') pour maintenir ladite barrière anti-inondation (20) à l'avant contre l'action contraire desdits éléments d'étanchéité élastiques (30) ;

**caractérisé en ce que** chacun desdits côtés (22, 22') est délimité en haut par une portion creuse (220, 220') qui loge un rouleau (222, 222') porté d'une manière rotative dans une direction transversale à ladite direction (D) ; chacun desdits éléments en opposition (12, 12') étant délimité en haut par une pièce de tête (122, 122') ayant des moyens de poussée (1222, 1222') conçus pour agir par ajustement de forme sur chaque rouleau (222, 222') respectif afin de presser ladite barrière anti-inondation (20) contre ledit sol (P).

2. Le dispositif selon la revendication 1, **caractérisé en ce qu'**au moins une pièce de tête (122, 122') a une largeur supérieure à celle de ladite barrière anti-inondation (20) ; lesdits moyens de poussée (1222, 1222') comprennent un siège central (1220, 1220') substantiellement cylindrique pour ledit rouleau (222, 222') et une portion avant (1224, 1224') pour la fixation de ladite pièce de tête (122, 122') qui a une épaisseur qui croît dans la direction dudit siège (1220, 1220').
3. Le dispositif selon la revendication 1 ou la revendication 2, **caractérisé en ce que** lesdits moyens de fixation (50) comprennent un ergot (52) pour chacune desdites bases (14) porté face audit appui (120, 120') afin de délimiter un espace, dont la profondeur approche une épaisseur du côté (22, 22') correspondant de ladite barrière anti-inondation (20).
4. Le dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**il comprend des moyens de sécurité (60) conçus pour bloquer lesdits côtés (22, 22') de ladite barrière anti-inondation (20) contre lesdits appuis (120, 120') et ledit bord (24) contre ledit sol (P).
5. Le dispositif selon la revendication 4, **caractérisé en ce que** lesdits moyens de sécurité (60) comprennent au moins un verrou (62) porté en haut par ladite barrière anti-inondation (20) sur ledit côté (22, 22') dans une position donnant sur ladite pièce de tête (122, 122') respective mobile entre une position neutre en chevauchement complet avec ladite barrière anti-inondation (20) et une position de fonctionnement en chevauchement partiel avec ladite barrière anti-inondation (20) et une position en interaction avec ladite pièce de tête (122, 122') correspondante

dans un logement (1224, 1224') correspondant.

6. Le dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit bord (24) est convexe et en V, une barre (70) profilée à section en V étant présente entre lesdites bases (14, 14') desdits éléments en opposition (12, 12') dudit sol (P) et ayant une portion concave (72) pré-agencée pour loger ledit bord (24) d'une manière hydrauliquement étanche.
7. Le dispositif selon la revendication 6, **caractérisé en ce qu'**il comprend une bande (40) de matériau élastomère entre ladite barre (70) et ledit bord (24).
8. Le dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**il comprend des moyens anti-déformation (90) associés à ladite barrière anti-inondation (20) et pourvus d'une pluralité de verrous (91) répartis le long de ladite barrière anti-inondation (20) et pourvus de pènes (92) conçus pour s'engager sélectivement dans un trou (94) pratiqué dans ledit sol (P).
9. Le dispositif selon la revendication 8, **caractérisé en ce qu'**au moins un desdits trous (94) loge une douille (96) normalement fermée accessible verticalement contre la poussée d'un ressort.

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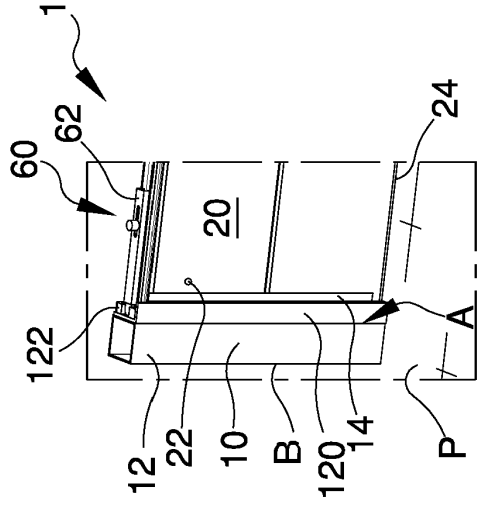
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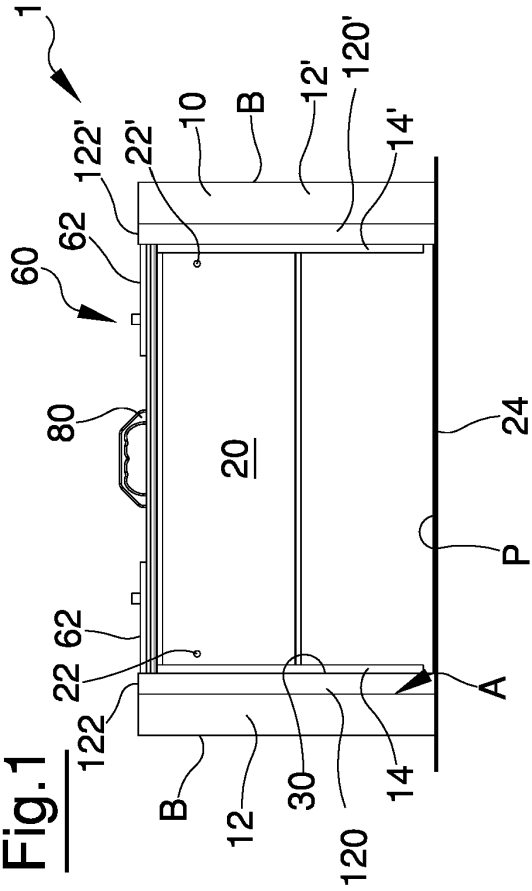
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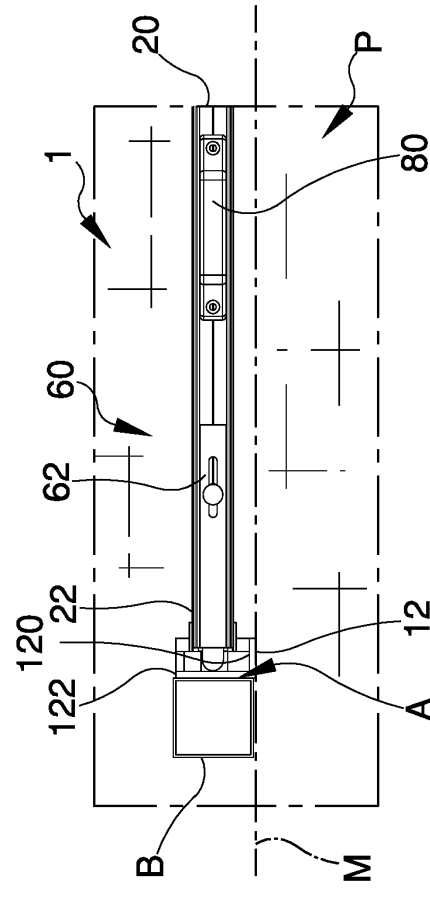
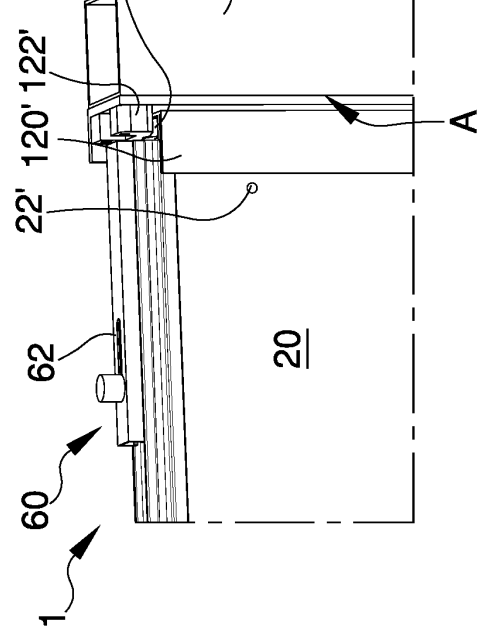
**Fig.2**



**Fig.1**

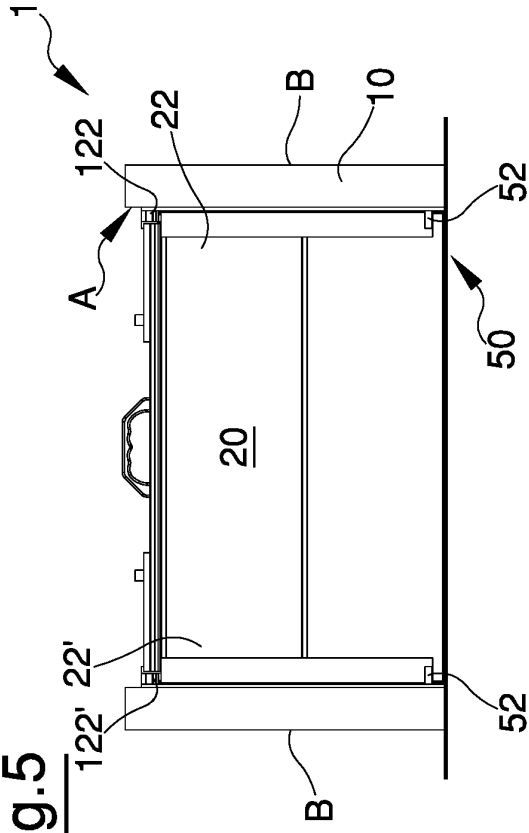


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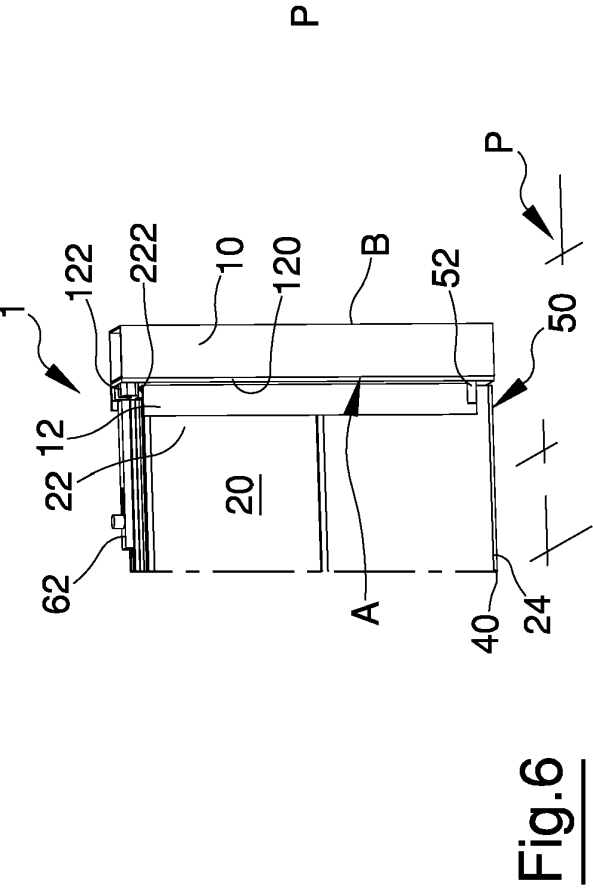
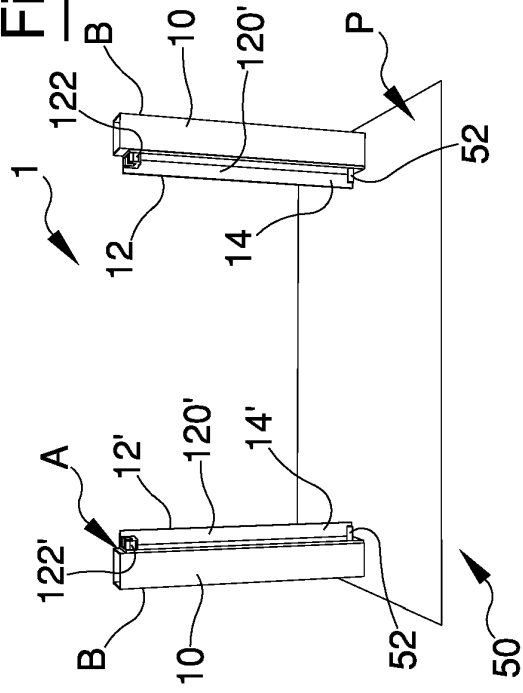


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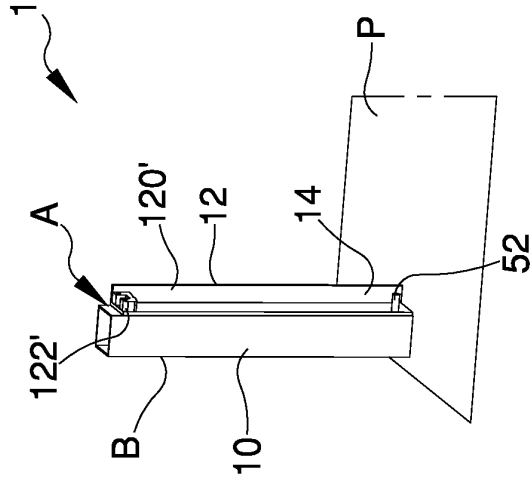
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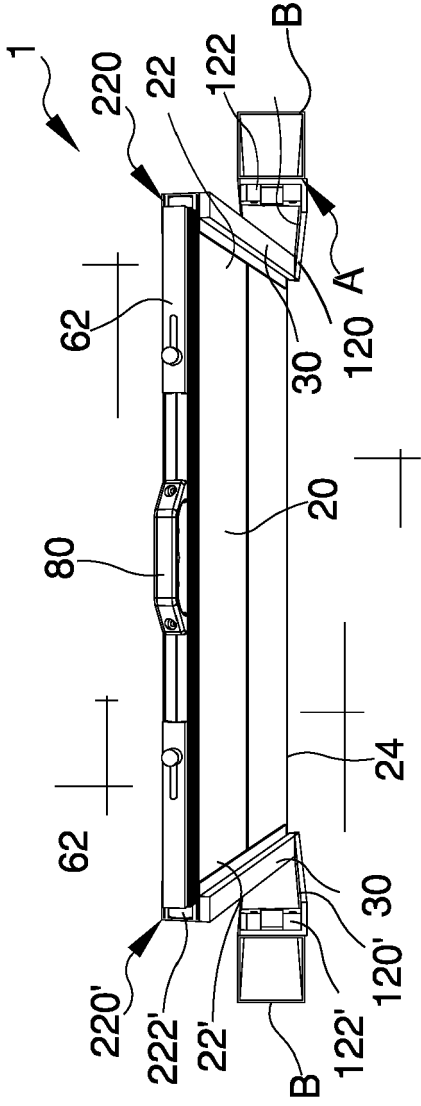
**Fig.7**



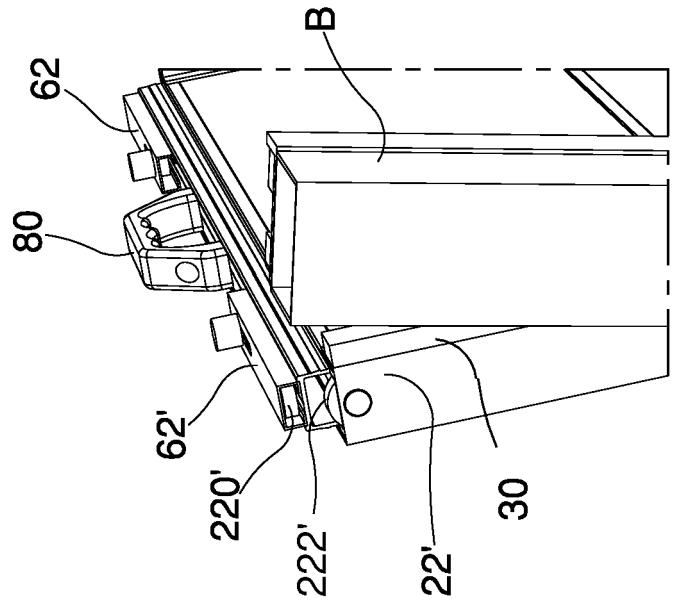
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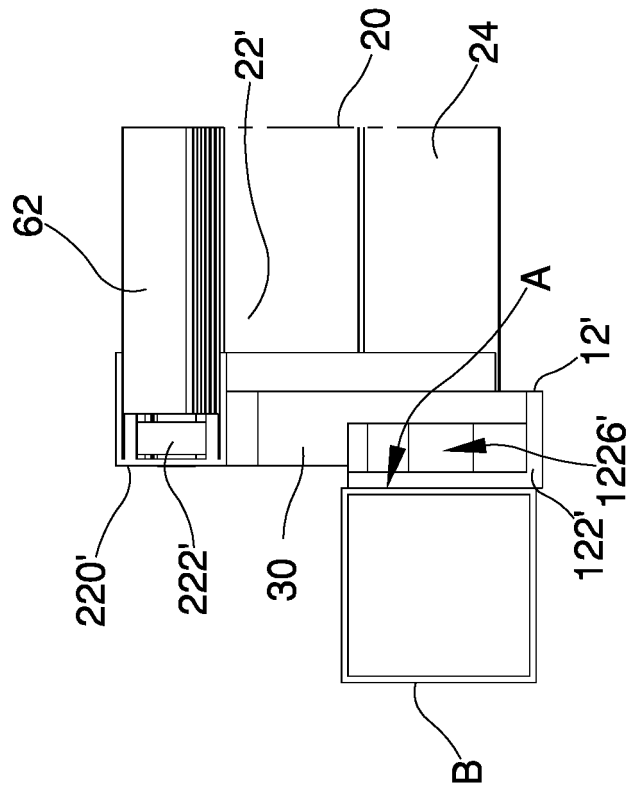
**Fig.8**



**Fig.9**

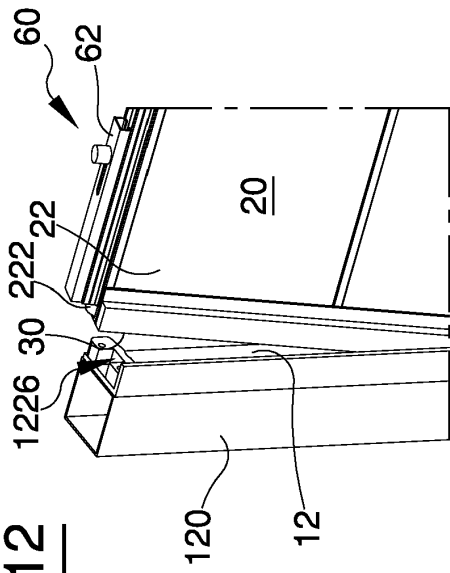


**Fig.10**

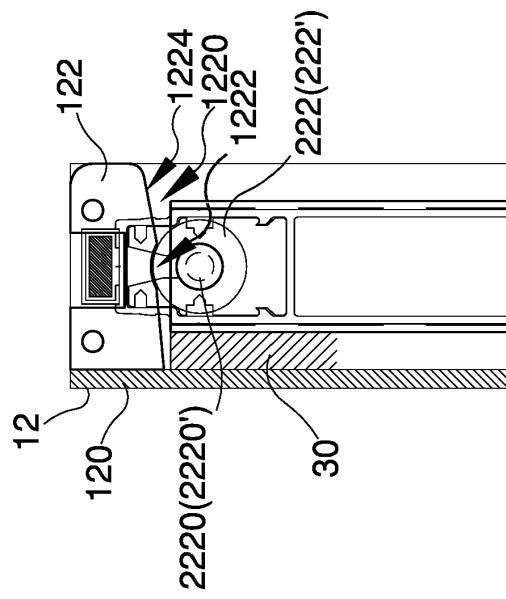
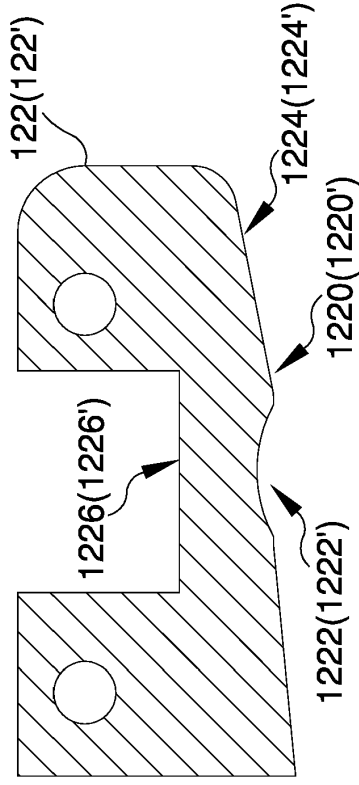


**Fig.11**

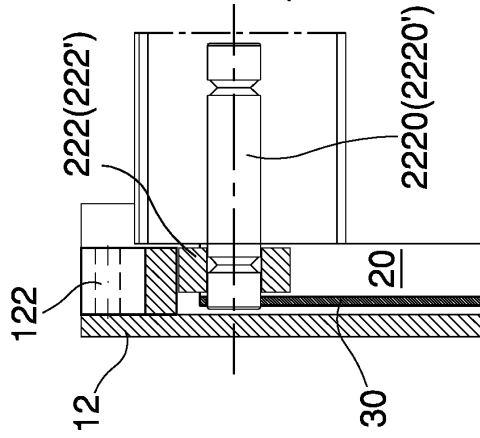
**Fig.12**



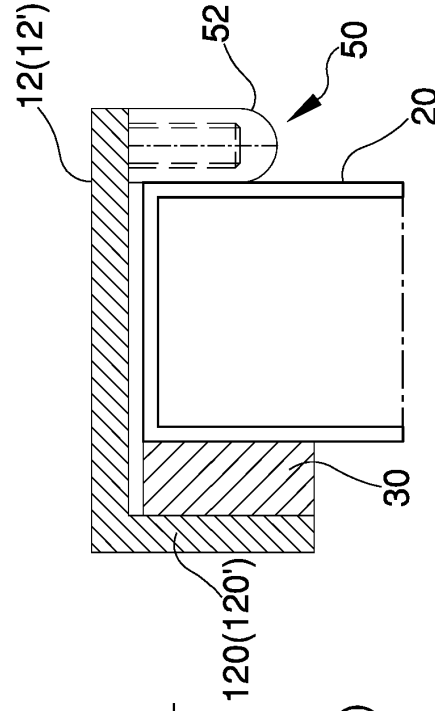
**Fig.13**



**Fig.14**



**Fig.15**



**Fig.16**

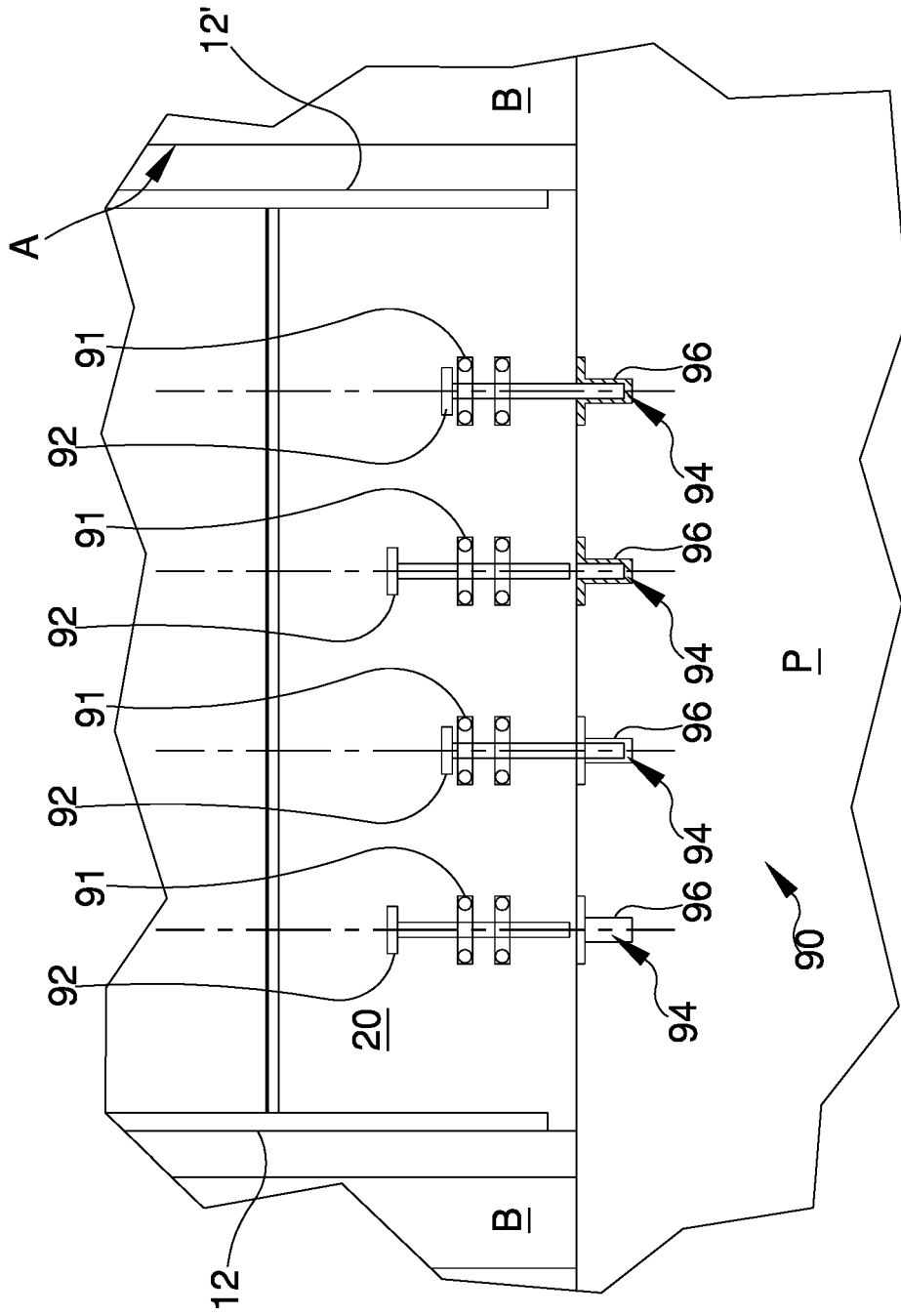


Fig.17

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- EP 2703563 A [0008]
- US 7523589 B [0008]
- GB 2243393 A [0008]
- CN 107120051 [0008]