

Diego Gonzalez Castillo

1) Family number: 76586059 (CN209652961U)

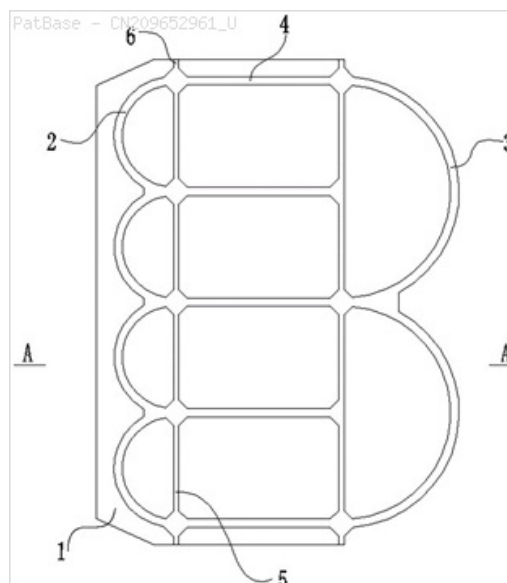
© PatBase

Title: Applicable to ocean engineering and construction arc wall caisson structure (Machine translation)

Abstract: Source: CN209652961U **Machine translation:** The utility model discloses a marine engineering building arc wall caisson structure, comprising a bottom plate (1), a front wall, a rear wall (3), (2) side wall (5) and (4), the partition wall (6); wherein the side wall (4) inverted filter wells walls, partition walls (5) and bottom plate (1) composed of a plurality of rectangles arranged in a side-by-side chamber; a front wall and the rear wall of the caisson (2) and (3) respectively with the quay, wharf rear direction of the partition wall (5) and caisson bottom plate (1) connected to form a semi-circular side walls (4) connected to the outer chamber, inverted filter wells wall (6). The utility model as compared with ordinary rectangular caisson force more reasonable, cheaper materials; and the large cylindrical concrete caisson upper chest wall compared to force more reasonable, foundation trench excavation and backfill amount less on the wharf front of mooring conditions better, saving construction materials, shorten the construction period, with a better economy, while also improving mooring conditions, in gravity wharf projects have broad application prospects.

Classifications:

International (IPC 8-9): E02B3/06 E02D23/00 (Advanced/Invention)



Family:

Publication number	Publication date	Application number	Application date
CN209652961 U	20191119	CN201920040091U	20190110

Priority:

CN201920040091U 20190110

Probable Assignee:

BEAR AO

Assignee(s):

BEAR AO

2) Family number: 72008108 (CN108867758A)

© PatBase

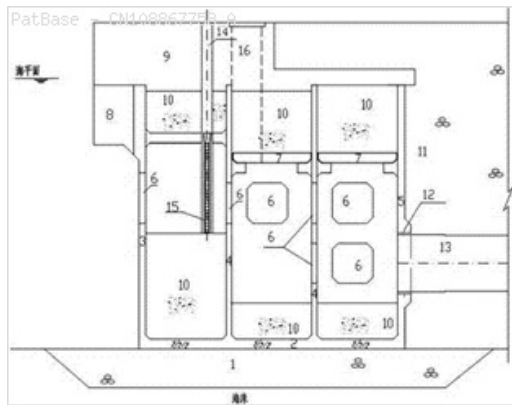
Title: WHARF CAISSON WATER TAKING DEVICE AND CONSTRUCTION METHOD

Abstract: The invention provides a wharf caisson water taking device and a construction method. A reinforcing bar caisson comprises a caisson compartment which is formed by a front wall, a rear wall, side walls, a longitudinal separating wall and a transverse separating wall and is characterized in that a flow guiding wall is arranged in the reinforcing bar caisson, a water inlet hole is formed in the front wall, energy dissipation holes are formed in the longitudinal separating wall and the transverse separating wall, a hole is formed in the rear wall, the hole is connected with a large water taking pipe, the large water taking pipe is provided with a water sealing component, and concrete is poured on part of the bottom and top of the caisson compartment to form a dam body of a gravity wharf, the lower portion of the dam body is a block stone bed on the sea floor, the upper portion is a reinforcing bar concrete breast wall, the rear side is a block stone prism, and the top is a surface layer structure. According to the device, a water taking port is combined with a large wharf structure, a sea area is not needed to be selected separately to form the water taking hole, the occupation on thesea area is reduced, a large amount of construction time is saved, and a large amount of engineering cost is saved. The caisson water taking structure is reasonably arranged to protect the safety of facilities in a harbor basin.

Classifications:

International (IPC 8-9): E02D23/02 E02D23/08
 E03B3/06 (Advanced/Invention)

CPC: E03B3/06 E02D23/02 E02D23/08



Family:

Publication number	Publication date	Application number	Application date
CN108867758 A	20181123	CN201810793008	20180718

Priority:

CN201810793008 20180718

Probable Assignee: TIANJIN PORT ENG DESIGN AND CONSULTING CO LTD OF CCCC FRIST HARBOR ENG CO LTD

Assignee(s): (std): TIANJIN PORT ENG DESIGN AND CONSULTING CO LTD OF CCCC FRIST HARBOR ENG CO LTD

Assignee(s): TIANJIN PORT ENGINEERING DESIGN AND CONSULTING CO LTD OF CCCC FRIST HARBOR ENGINEERING CO LTD ; CCCC TIANJIN HARBOUR ENGINEERING DESIGN INST CO LTD

Inventor(s): (std): CHENG LEI ; DENG HONGYAN ; HAO XIAOLI ; LI LU ; LIU XIANGYU ; LIU XUEWU ; QU HOUDONG ; SUN SHUJUAN ; WANG BINGQUAN ; WANG CHENGSHENG ; WANG GUOZHI ; YIN GANG

3) Family number: 74634118 (CN208949969U)

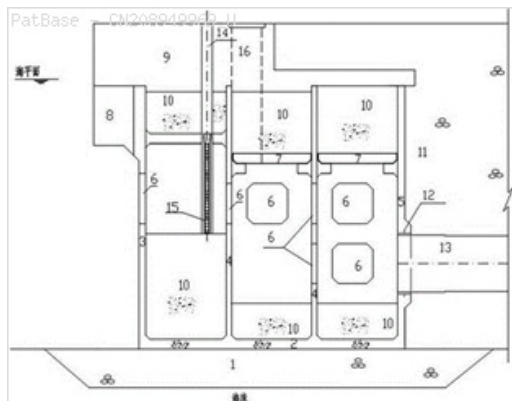
© PatBase

Title: WHARF CAISSON WATER TAKING DEVICE

Abstract: The utility model provides a wharf caisson water taking device. The reinforced concrete caisson comprises caisson cabins formed by a front wall, a rear wall, side walls, longitudinal partition walls and transverse partition walls. The reinforced concrete caisson is characterized in that a flow guide wall is arranged in the reinforced concrete caisson, a water inlet hole is formed in the front wall, energy dissipation holes are formed in the longitudinal partition wall and the transverse partition wall, a hole is formed in the rear wall, the hole is connected with a large water taking pipe, the large water taking pipe is provided with a water stop component, and concrete is poured at the bottoms and the tops in part of caisson cabins. A block stone foundation bed on the seabed is arranged below the dike body part, the upper portion of the dike body part is a reinforced concrete breast wall, the rear side of the dike body part is a block stone prism, and the top of the dike body part is a surface layer structure. The water intake and a large wharf structure are combined into a whole, a sea area does not need to be independently selected for building the water intake, occupation of the sea area is reduced, a large amount of building time is saved, and a large amount of engineering cost is also saved. A caisson water taking structure is reasonably arranged, and the safety of facilities in the harbor basin is protected.

Classifications:

International (IPC 8-9): E02D23/02 E02D23/08
E03B3/06 (Advanced/Invention)



Family:

Publication number	Publication date	Application number	Application date
CN208949969 U	20190607	CN201821140518U	20180718

Priority:

CN201821140518U 20180718

Probable Assignee: TIANJIN PORT ENG DESIGN AND CONSULTING CO LTD OF CCCC FRIST HARBOR ENG CO LTD

Assignee(s): (std): TIANJIN PORT ENG DESIGN AND CONSULTING CO LTD OF CCCC FRIST HARBOR ENG CO LTD

Assignee(s): TIANJIN PORT ENGINEERING DESIGN AND CONSULTING CO LTD OF CCCC FRIST HARBOR ENGINEERING CO LTD ; CCCC TIANJIN HARBOUR ENGINEERING DESIGN INST CO LTD

Inventor(s): (std): DENG HONGYAN ; CHENG LEI ; LI LU ; LIU XIANGYU ; LIU XUEWU ; QU HOUDONG ; SUN SHUJUAN ; YIN GANG ; WANG CHENGSHENG ; WANG GUOZHI ; WANG BINGQUAN ; HAO XIAOLI

4) Family number: 53725127 (US2013118113A)

© PatBase

Title: SOLAR SYSTEM MOUNTING ASSEMBLY

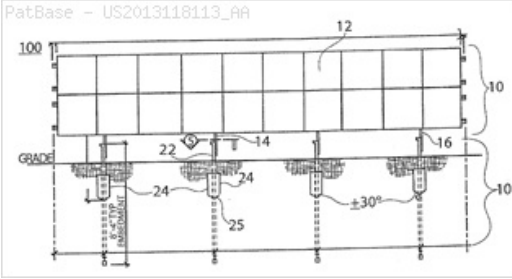
Abstract: A ground mounting assembly, system and methods for ground mounting a structure include a plurality of posts, each of which are attached to at least one stabilizing plate. The posts may be at least partially positioned underground, with the connected stabilizing plates being buried to a depth of about 1 foot. Posts in a front portion of the mounting assembly may be connected to an adjacent one of posts in a back portion of the assembly by a cross member.

Classifications:

International (IPC 8-9): A61B5/00 E02B3/20 E02B3/24 E02D E02D17/00 E02D27/42 E02D27/50 E02D27/52 E02D5/22 E02D5/28 E02D5/54 E02D5/60 E02D5/74 E02D5/80 E02D7/02 E02D7/30 E04D13/18 E04H E04H12/22 E04H12/34 F24J F24J2/52 F24S25/12 F24S25/13 F24S25/617 H02S20/10 H02S20/32 (Advanced/Invention); E02D E04H F24J (Subclass/Invention)

CPC: E02D5/22 E04H12/347 E02D27/42 E02D5/223 E02D7/30 E02D5/60 E02D27/425 E04H12/223 E04H12/2215 Y02E10/47 Y02B10/12 Y02B10/20 F24S25/13 E02D5/285 E02D5/54 E02D5/74 E02D5/80 E02D7/02 E02D27/50 E02D27/525 F24S25/12 F24S25/617 H02S20/10 E02B3/20 E02B3/24 H02S20/32 E02D17/00

US: 1/1 136/244 248/545 405/231 405/232 405/244 405/253 405/255 52/741.14



Family:

Publication number	Publication date	Application number	Application date
CN104081136 A	20141001	CN201280066667	20121114
CN104081136 B	20180406	CN201280066667	20121114
CN110011599 A	20190712	CN201811393737	20181121
HK1202611 A1	20151002	HK20150103099	20150326
HK1202611 B	20190531	HK20150103099	20150326
US2013118113 AA	20130516	US20120676990	20121114
US2013272800 AA	20131017	US20130839842	20130315
US2016024739 AA	20160128	US20140777441	20140314
US2018155892 AA	20180607	US20170820173	20171121
US9574795 BB	20170221	US20120676990	20121114
US9611609 BB	20170404	US20130839842	20130315
US10352013 BB	20190716	US20170820173	20171121
WO13074667 A2	20130523	WO2012US65072	20121114
WO13074667 A3	20150611	WO2012US65072	20121114
WO14144327 A2	20140918	WO2014US28686	20140314
WO14144327 A3	20151029	WO2014US28686	20140314

Priority:

US20110560037P 20111115 US20120676990 20121114 WO2012US65072 20121114
US20130839842 20130315 US20140777441 20140314 WO2014US28686 20140314
US20150777441 20150915 US20170820173 20171121

Probable Assignee: KELLEHER STEPHEN

Assignee(s): (std): KELLEHER STEPHEN

Inventor(s): (std): KELLEHER STEPHEN

Agent(s): WENPING AND CO; HAYES SOLOWAY PC; SOLOWAY NORMAN P ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

5) Family number: 53755207 (CN202936761U) © PatBase

Title: WHARF MODULE CAPABLE OF FLOATING TRANSPORTATION AND TOWING SHIPMENT AND WHARF STRUCTURE

Abstract: The utility model discloses a wharf module capable of floating transportation and towing shipment and a wharf structure. The wharf module comprises a box cylindrical base, wherein the box cylindrical base consists of a basic top cover and basic side walls; a plurality of partition plates fixed in the basic top cover are arranged inside the box cylindrical base; the basic top cover, the basic side walls and the partition plates form a plurality of subdivision structures with an opened bottom; a hollow horizontal buoyancy box is fixedly connected to the upper part of the box cylindrical base; two hollow vertical buoyancy boxes are fixedly and symmetrically fixed to the upper part of the horizontal buoyancy box; a wharf pavement panel is fixedly connected to the tops of the two vertical buoyancy boxes. The wharf module has a simple structure, is convenient to manufacture, environment-friendly and particularly suitable for geological conditions of coral reefs; the damage to ecological balance of the coral reefs is avoided; and the construction feasibility of the coral reef wharfs is broken through; and meanwhile, the wharf module has the advantages of capability of floating transportation and towing shipment, accurate sinking and leveling, controlled sedimentation and the like, the construction is fast, and the construction difficulty is reduced.

Classifications:

International (IPC 8-9): E02B3/04 E02D15/08 E02D27/52 (Advanced/Invention)

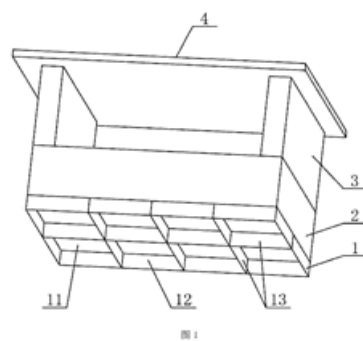


图1

7

Family:

Publication number	Publication date	Application number	Application date
CN202936761 U	20130515	CN201220598972U	20121112

Priority:

CN201220598972U 20121112

Probable Assignee:

UNIV TIANJIN

Assignee(s): (std):

TIANJIN UNIV ; UNIV TIANJIN

Inventor(s): (std):

DING HONGYAN ; ZHANG PUYANG

6) Family number: 45861260 (CN201506969U)

© PatBase

Title: LARGE-DIAMETER DYKE TUBULAR PILE AND DYKE OR WHARF STRUCTURE THEREOF

Abstract: The utility model discloses a large-diameter dyke tubular pile and a dyke or wharf structure thereof. The dyke tubular pile comprises a riprap solid base, a wharf body and parapet walls and adopts large-diameter cast-in-situ thin-walled seawall tubular pile structures which are seawall tubular pile structures provided with steel reinforcement cages or porous seawall tubular pile structures provided with no steel reinforcement cage; two to three rows of large-diameter cast-in-situ thin-walled seawall tubular pile structures are arranged along dyke lines; a bent structure capable of reducing the diameter of the piles 1.5 to 3 times is adopted in the space between thin-walled seawall tubular piles; the seawall tubular pile structures provided with the steel reinforcement cages are structure stretching out of water and are connected through connecting beams between the tubular piles; and the porous seawall tubular pile structures provided with no steel reinforcement cage are structures arranged at the seabed and adopt multiple rows of implantation seabed as vertical dyke reinforcing structures. The space between the piles is shortened, the higher replacement rate is obtained, the section is reduced and the land is saved; the thickness of the back-pressure cushion layer is greatly increased; the cost-performance ratio advantage is obvious; and resources are saved to a larger extent, the environmental pollution is reduced, and the production efficiency is improved.

Classifications:

International (IPC 8-9): E02B3/06 E02B3/10 E02D27/12 E02D27/28
E02D27/52 E02D5/40 (Advanced/Invention)

CPC: Y02A10/13 Y02A10/14

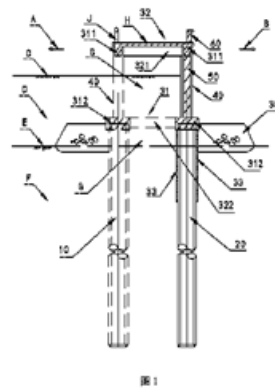


图 1

6

Family:

Publication number	Publication date	Application number	Application date
CN201506969 U	20100616	CN200920308833U	20090826

Priority:

CN200920308833U 20090826

Probable Assignee: ZHEJIANG HAITONG HIGH TECH ENGINEERING CO LTD**Assignee(s):** (std): HAI TONG HIGH TECHNOLOGY CO LTD ; ZHEJIANG HAITONG HIGH TECH ENGINEERING CO LTD**Assignee(s):** ZHEJIANG HAITONG HIGH TECH ENGINEERING CO**Inventor(s):** (std): DONGSHU CHEN ; JING XIE ; QINGDAO XIE**Inventor(s):** XIE JING ; XIE QINGDAO ; CHEN DONGSHU**7) Family number: 21894285 (US2966778A)**

© PatBase

Title: CAISSONS FOR WHARF CONSTRUCTION AND METHOD OF INSTALLING SAME

Abstract: Figure 3 is an elevation of said caisson viewed from the right of Figure 2. Figure 4 is a top plan of the caisson of Figure 3. Figure 5 is a side view of a caisson under construction at a tidal basin. Figure 6 is a horizontal section of a detail. Figures 7 to 11, inclusive, are cross sections of such a caisson in various preliminary stages of the setting up operation. Figure 12 shows in perspective, part of installation as it appears when completed; and Figure 12a shows another detail. As illustrated in Figure 1, the body of the wharf consists mainly of several caissons or coffer-dams arranged end to end along the line of a shore or bank 10. See Figures 2 and 12. The caissons all have closed bottoms and open tops. They are constructed on the land near the site, floated, flooded with water to keep their open tops uppermost, and moved to the site to be sunk upon the earth under the water; the submerged soil having been previously prepared to receive them. Each caisson has the over-all shape of an elongated box with closed bottom 1, deep sides 2 and 3, and ends 4. The sides and ends are respectively parallel to each other, with the ends 4 perpendicular to the bottom, but the parallel sides 2 and 3 are canted or tilted in the same direction, so that the angle they make with the bottom are each different from a right angle, as is made clear on Figures 2, 5, 7, 8, 9, 10 and 11. The caissons thus lean backward, so to speak, towards the shore and have greater stability; and the stability is further increased by a long projecting toe or ledge 5 along the outer side 2 at the bottom 1. The interior of each caisson has a full length longitudinal partition or bulkhead 6 standing midway between the sides, and parallel thereto; and transverse partitions or bulkheads 7 reaching from one side to the other, and parallel to the ends 4. These partitions all extend up from the bottom to the top of the caisson and divide the interior of the caisson into two long rows of compartments 8 and 9. When the caissons have been sunk at the site and rest with the bottom on the earth under the water, the compartments are all loaded and filled with rocks which act as ballast, holding the caissons upright and preventing displacement, as long as the ground under them remains firm enough to support their weight. The earth under the water at the site of erection is first scooped or dredged to present a shallow trench or bed 11, near the shore line 10, as shown in Figures 2 and 12. The trench receives a layer of sand 12 and then is filled level with stone and gravel 13. The partition 6 is parallel to the sides 2 and 3. After the caissons have been correctly located end to end on this bed 11, the space between the inshore sides 3 of the caissons and the bank or shore 10 is filled with stone 14, piled against the side 3 and other materials 15 back of the layer 14, till a level stretch of ground is obtained substantially flush with the tops of the caissons; the height of the sides 2 and 3 and the depth of sinking of the caissons being calculated in advance to give this result. The caissons all have considerable length and when several are disposed end to end at the site, a wharf or pier several hundred feet in length can easily and quickly be constructed. The ballast in the compartments 8, and 9 enables the caissons to withstand the pressure of whatever material is dumped in to fill the space between the land and the sides 3, and the ledges 5 along the bottom at the outer side 2 help to offset such pressure. With the walls 2 and 3 slanted and the caissons heavy enough, the ledges 5 can be omitted. Each caisson is preferably made of reinforced concrete and is built in a shallow tidal basin close to 4y' of water but separated from it by a dam or dike along the shore, and pumped out dry. When the basin is flooded later the caisson or coffer-dam is floated out and towed to the chosen site in the manner indicated on Figures 5 to 11 inclusive. The caissons are cast by pouring concrete into molds put up in the tidal basin 16 near the large body of water 17. The surface of the basin is excavated to a required depth below the level at high tide of the water 17, and protected by the dike or dam 18. This dike has conduits or flumes 19 running through it at the level of the floor of the basin 16, and each conduit is controlled by a gate valve 20, so that the basin can be flooded and drained at will. Each caisson is built in the basin with the side 3 prone and the other side 2 above it; the bottom 1 being slanted or tilted slightly and the ends 4 upright. When the bottom, sides and ends have set and hardened, the caisson will be as it appears in Figure 5. Each caisson needed in the operation is then equipped with temporary bulkheads, disposed parallel to the bottom, and located so as to close in part what will later be the open top of the structure. The temporary bulkheads are indicated at 21 and 22 and extend

PatBase PDF Export - Page: 6 10/02/2020

the water depth in the bottoms I perfectly horizontal. Several trials with all the tanks 30 and the outside draft are read accurately each casson may be necessary, water being pumped in from the respective gages and are then recorded. and out of the compartments 8 and 9 to lift and settle the I As the tide recedes, the caisson will again come to rest 55 cais son till correct position is attained. During this on the basin floor. However, if bulkheads 21 and 22 are _stage outside water can flow free through the caissons reasonably leak-proof, the water is, retained in the tanks 30. This is done t,o avoid the necessity of re-gaging and r6-adjusting that water when the caisson is to be tow6d 6ut of the basin. . Next, the portion of the dike 18 to be used as outlet is breached, all the, way down,to the basin floor level, dtiring periods of low tide. With the basin open to the body of water 17,, thus the caisson will alternately float and sett le with the variations of the tide, but, being still correctly ballasted, it will always maintain its horizontal position. At the selected high tide, the caisson is towed out of the basin through the dke's breach and is moored in a convenient location until all preparations for the careening or righting operations are completed. The pumping equipment required for righting operation is made re_dy on rafts. A site is selected where there are not less than about feet at low tide; and on a fairly clalm day, the caisson is tomied to the site and moored tb-,re by its two ends, wittt plenty oi room and SUMCiC4t from the outer side 2 to the inboard side 3 through ducts 32, built into the transverse bulkheads 7, just below the low tide level, t_e ends of these ducts in the_ sides 2 and 6o 3 being open. Thus the water is maintained at the same level along the side 2 and 3 during the settling operation, and disturbance of the stability of the caissons is prevented. When the sinking of the caissons has been satisfac- torily performed by pumping water into the compartmentns 8 and 9 to the required depth, holes 33 in two horizontal rows are opened in the bulkhead 6, two in each horizontal row of holes being between each two' adj6cent bulkheads 7. These holes are formed in pl_ce 70. when the caissons are built but are kept closed by plugs, 34. The upper row of holes 33 are just below the high water level and the lower row just under low tide level adjacent the conduit 32. These holes are opened at low tide by men in boats or on rafts who knock out the plugs 34. The upper and lower holes are, matr_hcd by t_pp,_r and lower holes 35 and 36 at the same levels in the sides 2 and .3, which dre also o ened by rem_vifii t_6 P sam6 ki_d of plugs 34. The watei can now rise and fall Witfi the tide in all the caissons, which are then fill6d bottom to the tops with rock ballast, 37 in the comr par,tipents 8. and 9, and the, flu 14 and, 15 is heapdd in betwe6n the shore and the side 3. A jcopin g wal'I 38 is cast along the top of the side 2 and earth is laid on th;e caissons and fill to make a smooth toO surface. The adj_cent ends of the caissons have vertical flanges 39. appro;aching each other, and the space between said ends is filled with rocks like th_ rocks 14. To fitfth the wharf, vertical fenders 41 are attached to the outer wall 2 of each caisson b_ _olts embedded in the concrete. The fenders are all in line with the bulkheads 7, a'nd to each fender near the top a steel cable 42 is afixed. The lower ends of these cables are anchored to concrete blocks 44 in the bed 11. Aloiaig the _xont of each caisson runs a floating fndner of wooden b_6ams, _ith sleeves 43 through which the cables pass, The fenders are fiee to rise and fall with the tide but dre kept in place at the water line by the cables 42. At the opposite ends of the entire wharf, the caissons have _ertical beams 46 and 47,, the former secured to the end flang6s 39, and these beams are joined by horizontal _vale,_ 48 extending from the top down to low tide level to protect the ends of the wharf against ve_sels, barge-s o_,lighters that might bu_np against the ends. Having described my invention, what I believe to 1)6 new is: 1. A caisson ha_ing closed bottom, sides and ends and _n_ open t6p, a central longitudinal bulkhead exte_din_ b-et,X,Ceii the ends, and transv_rse bulkheads extending between the sides and intersecting the longi_pginal bulkhedd, said transverse bulkheads and the longi_pdin al bulkhead dividing the interior of the caissoti into cor_p_riments bet_ _een said longitudinal bulkh-,ad and said sides, some of said transverse,bul.kheads bei,ng imperforate and _aving_ one or more of the other transverse bulkh(-,ads and a group of said compartmen'ts between them and se_lihg the compartments of said grou_p from the remaining c6m,,3artnrnts, the transv_rse bulkheads between said imperforate bulkheads having openings puttin all the compartme,nts of each grg_4p on one side of the,c6ntral 6t_ _bead int-o cominunication with one, another_ said openings being a jacerit a side of the caisson for the comd p_rtments between the central bulkhead and said side, and adjacent the central bulkhead for the remaining cg;n7, partment,,; of th6 gf6up between the central bulkhead and the. 6pposite side. _aisso_ ha_ing clos6d bottom, sides and ends and an open top, a central longitudinal bulkhead extending between the ends, and transverse bulkheads extending bef_v'cen ihe sides and intersecting the longitudinal bulkhead, said transverse bulkheads.and the longitudinal bulkhead dividing the interior of the caisson into I comp4rtm6iit_ between_aid lon_itudinal bulkhead and said_sides, _o'iilie of said tra_nsverse bulkbeads being imprrforate and b6V_-'n one o -f the g_r more 0 other transverse bulkheads aid _ gro_ of said compartments between th and s_a.li'n_ the, co'mpartments of, said group, from the, rem_i6in_ c6mpartn-ients, the transverse bulkheads between said imperforate bulkheads,having,ope riings putting pll ti-16 c,,O-mpartments of each groii one one side of the cenp tr,-,! 'oil_-head inio- communication With one another,,said openings being adjacent a side of the caisson for the comp.'irtm' ents. between the central bulkhead and said sid_ , and a cent ihe c6niral bulkhead for the remaining _qmpartments of thl. grou6 between the central bulkhead and the opposite side, the transverse bulkhea_s ca 7yin- ducts that ate paf_ llet to the boitom afid pass throug4 _he lon_ tudi_al billlthead, _id ducts havin!_z both ends open i.i the sid6_ the cais_6ii. A c6is_'on having cios6a b-ottom, sides and ends aii At opeli iop, a central lonjitudifi_l bu'lkh-cad _xtendi bet_ _een the ends, and trnsverse bulkheads ex_ ,ng tel_ding between the sides and intersecting tl-ie longitudinal bulkhead, said tran verse bulkheads and the longitudinal bulkhead dividing the interior of th6 caisson into com- 6 partments between said longitudinal bulkhead and said sides, s,ome of said transverse bulkheads,being imp_rforite and having one or more o e 0 er transverse bulkheads and a group of said compartments between , them and sealin.a, the, compartments of said _roiip from e remainin.- ec)mpartments, the transverse bulkheads t d imperforat'e bulkheads having openings putcompartments of each group gne one side of bulkhead into com-munication with one, anot_16r said, ppenings being adjacent a side of the caisson for the compartments between the central bulkhead rind said side, and adjacent the central bulkhead for the remaiiing comp4rtments of the group between the central bulkhead and the opppsite side, the transverse bulkheads carrying. ducts th.at ai-e parallel to the bottom and pass tlrough the longiuidinal bulk_head, said ducts ha,,,ing both end_, open in the sides of the caisso_, s_ _id Qaisson baving a row of horizontal openings bel6w th'e iop in each side and in the central bulkhead and another row of horizontal openings below' the first named row in.each side and ifi th.e central bulkhead, ihe openings in both rows being between transverse bulkhe'ads. A caisson having closed bottom, sides and ends a'nd an op(_n top, A central longitudinal bulkhead extending b6t_6e_ the ends, and transverse bulkheads extending be- tween the sides and,intersecting the longitijidinal bulkhead, said transverse bulkheads and the longitudinal bulkli_ _dividini th_ int_rior of the caisson into compartments between said longitudinal bulkhead and said sides, some of said transverse bulkheads being imperforate and having one or more of the other transverse bulkh6ad_ and a group of,said compartments between thefii and sealin_ g the compartments 6f said group from the remaining compartments, the transverse bulkheads bet_ _veen said im_erforate bulkheads having openings puttifi,, all the com- p'artments of each group on one side of the central bulkhead into communication with one another, said openirigs being adjacent a side of the caisson for the compartmen.ts between the central bulkhead and said side, and aojacent the central bulkhead for the reniaining.com- partnrnts _f the group between th6 ceitral bulkhea.d. and the Opposiip side, the transverse bijlkhea-ds ca_ryin_ ducts that. are.parallel to the bottom and pass through the londin_i _lkhead, said duct ha_-in b6th ends open in gitu c_ \$9 the _ici6_ _f the isson, said c_isson h4'y'ln- . a row of horizontal openings -below the top in each sid6 and in the central bulkhead and another row of horizontal op6nings below. the first named row in each side,_iid in the celitral bulkhead, the openings in both ro-_vi being, between trans,_6 bulkh6ads,. said rows when the cais- sonlis.sunk and staidis on the earth beneath a body of w_ _ter' beifig r6sp_ ctively below the high tide level and low tide level of s_ _id _7ai6r. _The meth_a _of _6_sti-uctini a _arf _ _ch consists in building a caisson in _t; n ' h _oth side_ thereposi io wit 66 of ho izontal and one below the other, _nd the bottom vellical, creating a i_i_or_ry _ _id withi_ s_ _id _is_ on along. the lower side and re:mote fromi. t_6 bott6i_, fillin_ t_6 w6ighi _f th_ b_ _ti6m, floating s_ _id hold to baldnt, said caisson with said io_-e_ sia_ subnrnerged, evacuating said hold and Nveig4ling the caisson t6 t_ _n ii _pi_ght with the bottom lowermo_t, floating sai[d _aiss8n i_ ihe' shore line of. a booy of,: water 4nd sinking t_ _re till it rests on the bottom under said w_ _ter, _nd l_ _il_ sting and anchor g the ca sson to retain it in place. 6. A,wharf cornprispig caissons disposed end to end at the shore line of body of water, said caissons, having a., sides tilted to,_vard said shore line, rock ballast filling said caissons, rocks piled on the. inshore I sides of said caisson , ind a, fill of matprials between said t)iled rocks and siid shore line, said caissons each liavina two h'o'riz'oli', tal rows of openings in the opposite sides, one row below

Classifications:

International (IPC 8-9): E02D23/02 E02D27/18 (Advanced/Invention);

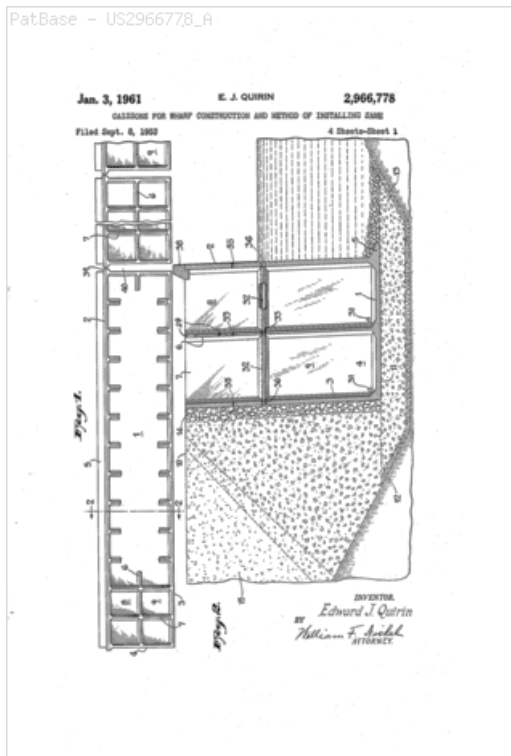
E02D23/00 E02D27/10 (Core/Invention)

International (IPC 1-7): E02D23/02 E02D27/18

CPC: E02D23/02 E02D27/18

European: E02D23/02 E02D27/18

US: 405/203

**Family:**

Publication number	Publication date	Application number	Application date
US2966778 A	19610103	US19530378816	19530908

Priority:

US19530378816 19530908

Probable Assignee:

FREDERIC R HARRIS INC

Assignee(s): (std):

FREDERIC R HARRIS INC

Inventor(s): (std):

QUIRIN EDWARD J

8) Family number: 59765325 (CN204475260U)

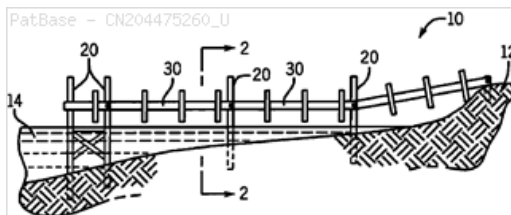
© PatBase

Title: NOVEL WHARF STRUCTURE WITH ADJUSTABLE HEIGHT

Abstract: The utility model discloses a novel wharf structure with adjustable height. The novel wharf structure comprises pile foundations and wharf elements, wherein wharf elements adopt basin-shaped structures and comprise first ends, second ends, side walls, end walls and base plates; inner cavities of the wharf elements are defined by the side walls, the end walls and the base plates; two cylindrical steel rings are arranged on the inner side of each of the first ends; each of the cylindrical steel rings forms a longitudinally arranged cylindrical opening; overlapped plates are arranged on the two sides of each of the second ends; a first hole for accommodating a fastener is formed in each of the overlapped plates; second holes for accommodating fasteners are formed in the cylindrical steel rings and the side wall parts. The novel wharf structure disclosed by the utility model is simple in structure, easy to produce and mount, capable of effectively resisting freezing and thawing cycle, and adjustable in height.

Classifications:

International (IPC 8-9): E02B3/06 E02D27/12
E02D27/52 (Advanced/Invention)

**Family:**

Publication number	Publication date	Application number	Application date
CN204475260 U	20150715	CN201520009886U	20150105

Priority:

CN201520009886U 20150105

Probable Assignee: WUJIANG TEXTILE SCIENCE AND TECHNOLOGY CT CO LTD**Assignee(s):** (std): WUJIANG TEXTILE SCIENCE AND TECHNOLOGY CT CO LTD**Assignee(s):** WUJIANG TEXTILE TECHNOLOGY CENTRE LTD ; WUJIANG TEXTILE SCIENCE AND TECHNOLOGY CENTER CO**Inventor(s):** (std): YANG BOJUAN**9) Family number: 43117468 (CN101387111A)**

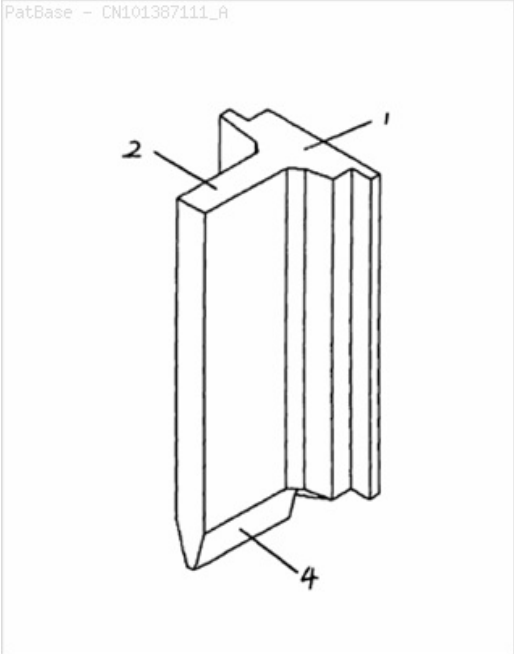
© PatBase

Title: Revetment T shaped pile with tongue and groove

Abstract: The invention relates to a grooved bank protection T-shaped pile. The invention aims to solve a technical problem of providing the grooved bank protection T-shaped pile with simple structure, strong stability and good water-soil stop effects, so as to improve the effect of treating gaps between adjacent pile bodies and reduce the material amount of bank protection retaining walls. The technical proposal for solving the problem is as follows: the grooved bank protection T-shaped pile is characterized in that the pile is in a T shape formed by a first panel and a web plate; the panel and a ribbed slab are in gradual change transition; and two wings of the first panel are provided with grooves. The T-shaped pile can be used for constructing river bank protections, wharf bases and ribbed-structure thin diaphragm wall retaining walls.

Classifications:

International (IPC 8-9): E02D5/03 E02D5/24 (Advanced/Invention); E02D5/02 E02D5/24 (Core/Invention)



Family:

Publication number	Publication date	Application number	Application date
CN101387111 A	20090318	CN200810061804	20080509

Priority:

CN200810061804 20080509

Probable Assignee: ZHEJIANG PROVINCIAL TRANSP ENG

Assignee(s): (std): ZHEJIANG PROVINCIAL TRANSP ENG

Assignee(s): ZHEJIANG PROVINCIAL TRANSPORTATION ENGINEERING CONSTRUCTION GROUP CO

Inventor(s): (std): JINKANG GAO ; JIANHUA LU ; HOUBIN FAN ; HANLONG LIU ; GUANGYAN SHAN ; SHENJIAN WANG ; YONGHUI CHEN

Inventor(s): WANG SHENJIAN ; SHAN GUANGYAN ; LU JIANHUA ; LIU HANLONG ; GAO JINKANG ; FAN HOUBIN ; CHEN YONGHUI

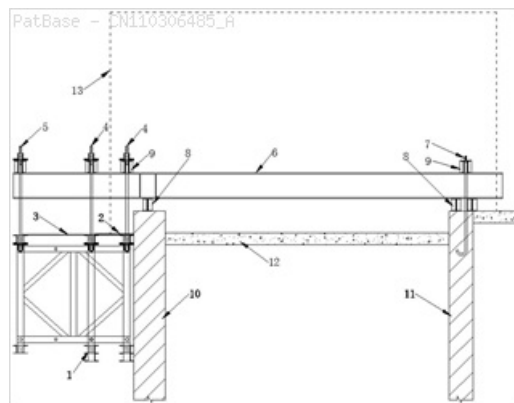
10) Family number: 76089562 (CN110306485A) © PatBase

Title: ADJACENT WALL TOP SUSPENDED BEAM TYPE CAISSON WHARF BREAST WALL CAST-IN-PLACE STRUCTURE AND METHOD

Abstract: The invention provides an adjacent wall top suspended beam type caisson wharf breast wall cast-in-place structure and method. The cast-in-place structure comprises bottom formwork girders arranged on one side of a caisson. Bottom formworks are laid on the bottom formwork girders. The two ends of each bottom formwork girder are provided with booms or hangers. The booms or the hangers are suspended through a suspended beam. The suspended beam is mounted on the tops of adjacent caisson walls or the tops of adjacent casted breast walls through first anchor rods. Thus, when the caisson is prefabricated, there is no need to pre-embed formwork bolts or pre-form formwork holes in the caisson walls. The formwork bolts are not exposed out of water level change areas on the side faces of the caisson thin walls or potential blockage and repair quality hazards do not occur to the formwork bolt holes. and the durability and reliability of the caisson are high. The bottom formworks are laid on the bottom formwork girders. The adjacent wall top suspended beam type caisson wharf breast wall cast-in-place structure is integrally arranged, is little influenced by tide water and is convenient to disassemble and assemble, high in effect and capable of saving manpower. Moreover, the bottom formwork girders are suspended through the booms, the elevation of the bottom formwork girders can be adjusted quickly and accurately. The suspended beam, the bottom formwork girders and other structures can be reused without loss. The adjacent wall top suspended beam type caisson wharf breast wall cast-in-place structure is high in total cost-performance ratio and easy to popularize.

Classifications:

International (IPC 8-9): E02B3/06 E02D15/02 (Advanced/Invention)



Family:

Publication number	Publication date	Application number	Application date
CN110306485 A	20191008	CN201910404906	20190515

Priority:

CN201910404906 20190515

Probable Assignee: CCCC FOURTH HARBOR ENG CO LTD

Assignee(s): (std): CCCC FOURTH HARBOR ENG CO LTD ; CHINA HARBOUR ENG CO LTD ; THIRD ENG CO LTD OF CCCC FOURTH HARBOR ENGINEERING CO LTD

Assignee(s): THIRD ENGINEERING CO ; CCCC FOURTH FARBOR ENGINEERING CO ; CCCC FOURTH HARBOR ENGINEERING CO LTD ; CCCC FOURTH HARBOR ENGINEERING CO LTD III BUREAU ; CHINA HARBOUR ENGINEERING CO LTD

Inventor(s): (std): CHEN MILI ; MO HONGWU ; LIAO SHIQIANG ; XU LIANG ; CEN WENJIE ; RAO HUALIANG

11) Family number: 62700757 (CN205557546U)

© PatBase

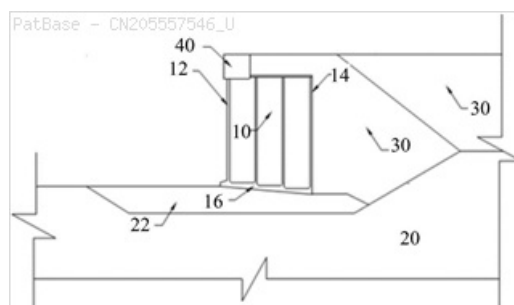
Title: WEDGE -FORM CAISSON STRUCTURE OF DIAPIRE AND WHARF STRUCTURE THEREOF

Abstract: The utility model provides a pair of wedge -form caisson structure of diapire and wharf structure thereof, its front end breach that can insert the harbour, wherein, the caisson includes the caisson storehouse check that a plurality of links to each other side by side, and caisson storehouse check include inner wall, antetheca and diapire, its diapire wedgewise, and inner wall and harbour breach side are tangent, and the diapire is tangent with the foundation bed at harbour to reinforcing wharf structure 's anti -skidding stability against overturning. The diapire of caisson storehouse check is the wedge, and its and domatic inclination are unanimous, insert the foundation bed breach to one side among, utilize between caisson structure and foundation bed interact to resist the horizontal force of pier, the backfill's in the caisson main part whole focus moves backward, increase the stability of antidumping.

Classifications:

International (IPC 8-9): E02B3/06 E02D23/00 (Advanced/Invention)

CPC: E02D23/00 E02B3/06



Family:

Publication number	Publication date	Application number	Application date
CN105696613 A	20160622	CN201610230456	20160414
CN205557546 U	20160907	CN201620310775U	20160414

Priority:

CN201610230456 20160414 CN201620310775U 20160414

Probable Assignee: CCCC AIRPORT INVESTIG AND DESIGN INST CO LTD

Assignee(s): (std): CCCC AIRPORT INVESTIG AND DESIGN INST CO LTD ; CCCC FHD I ENG CO LTD

Assignee(s): CCCC FOURTH HARBOR ENGINEERING INVESTIGATION AND DESIGN INST LTD ; CCCC FHD I ENGINEERING CO ; CCCC AIRPORT INVESTIGATION AND DESIGN INST CO ; CCCC AIRPORT SURVEY AND DESIGN INST LTD

Inventor(s): (std): FAN LIANGLIANG ; LI ZHIGANG ; LU JINHUA ; QIAN YUANMING ; SHEN KUNCANG ; SHEN KUNLUN ; WANG FUQIANG ; WANG GANG ; YANG BIAO ; ZHANG YONGKUN

12) Family number: 33519817 (CN2825743Y)

© PatBase

Title: Complete covered sheet pile structure for improving bearing capability of sheet pile wall

Abstract: The utility model discloses a complete curtain type sheet pile structure for enhancing the bearing capability of sheet pile walls, which comprises a front sheet pile wall, a back anchoring wall and an anchoring draw rod, wherein the front sheet pile wall is connected with the back anchoring wall by the anchoring draw rod; a plurality of curtain piles which are parallel with the front sheet pile wall are arranged behind the front sheet pile wall, and the distances between the curtain

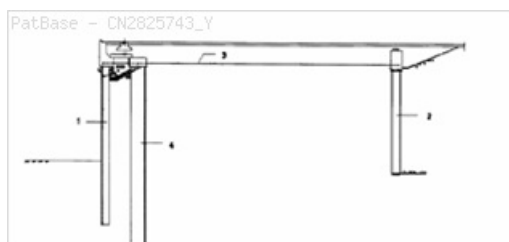
piles and the front sheet pile wall are about 1-10 M; the bottoms of the curtain piles are below the bottom of the front sheet pile wall. The utility model has the effects that the utility model adopts the curtain type sheet pile structure which can enhance the bearing capability of the front sheet pile wall, decreases the stress of the front sheet pile and creates the condition that a sheet pile wharf quaywall can enlarge water depth. Past sheet pile wharf quaywall is only suitable for small scale and middle scale wharves, and the complete curtain type sheet pile structure causes the sheet pile wharf quaywall to build large scale deep water wharves more than 10 thousand tons. Simultaneously, the utility model has the advantages that curtain piles all are constructed on ground, and do not be influenced by wind wave and the utility model has fast construction speed.

Classifications:

International (IPC 8-9): E02B3/04 E02D27/30

E02D5/02 (Advanced/Invention);

E02B3/04 E02D27/00 E02D5/02 (Core/Invention)



Family:

Publication number	Publication date	Application number	Application date
CN2825743 Y	20061011	CN200520123118U	20051117

Priority:

CN200520123118U 20051117

Probable Assignee: CHINA COMM FIRST DESIGN INST O

Assignee(s): (std): CHINA COMM FIRST DESIGN INST O

Assignee(s): CHINA COMMUNICATION FIRST DESIGN INST OF NAVIGATION ; CHINA COMMUNICATION FIRST DESIGN INSTITUTE OF NAVI ; CHINA COMMUNICATION FIRST DESIGN INSTITUTE OF NAVIGATION ENGINEERING

Inventor(s): (std): LIU YONGXIU DONG

Inventor(s): YONGXIU DONG LIU

13) Family number: 68661832 (CN107724261A)

© PatBase

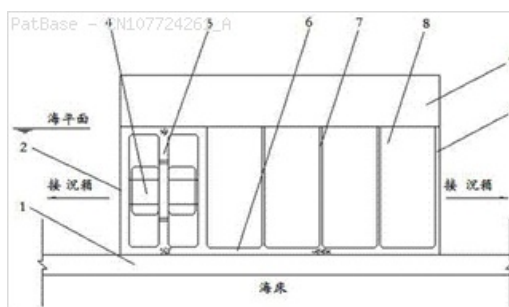
Title: BOX CULVERT AND CAISSON COMBINED STRUCTURE AND CONSTRUCTION METHOD

Abstract: The invention provides a box culvert and caisson combined structure and a construction method. The box culvert and caisson combined structure is characterized in that a water-flow box culvert and a large caisson are internally communicated through steel bars and integrally concreted to form the box culvert and caisson combined structure, and a same concrete bottom plate is arranged at bottoms of the water-flow box culvert and the large caisson. The box culvert is internally provided with water flow passages, a longitudinal partition wall is provided with a hole, and a front wall and a rear wall are provided with through holes. The box culvert and caisson combined structure forms a body part of a breakwater or a gravity wharf, a block stone base bed on a seabed is arranged below the box culvert and caisson combined structure, reinforced concrete breast walls and block stone mounds are arranged above the box culvert and caisson combined structure, and the top of the box culvert and caisson combined structure is provided with a surface layer structure. By replacement of respective transporting and mounting with integral transporting and mounting, frequency of launching at precast yards, remote floating transportation and mounting is reduced, construction time and cost are saved, and construction convenience and safety are achieved; by the water-flow box culvert structure, the problem of dock basin and open sea water exchange is solved, dock basin water quality is guaranteed, wave permeation is reduced, and safety of facilities in dock basins is protected.

Classifications:

International (IPC 8-9): E01F5/00 E02D23/00 (Advanced/Invention)

CPC: E01F5/005 E02D23/00



Family:

Publication number	Publication date	Application number	Application date
CN107724261 A	20180223	CN201710880528	20170926

Priority:

CN201710880528 20170926

Probable Assignee: TIANJIN PORT ENG DESIGN AND CONSULTING CO LTD OF CCCC FRIST HARBOR ENG CO LTD

Assignee(s): (std): TIANJIN PORT ENG DESIGN AND CONSULTING CO LTD OF CCCC FRIST HARBOR ENG CO LTD

Assignee(s): TIANJIN PORT ENGINEERING DESIGN AND CONSULTING CO LTD OF CCCC FRIST HARBOR ENGINEERING CO LTD ; CCCC TIANJIN HARBOUR ENGINEERING DESIGN INST CO LTD

Inventor(s): (std): DENG HONGYAN ; QU HOUDONG ; SUN SHUJUAN ; WANG GUOZHI ; YIN GANG

14) Family number: 33470833 (CN2823329Y)

© PatBase

Title: Half-covering sheet pile structure for improving sheet pile wall bearing capability

Abstract: The utility model provides a half curtain type sheet pile structure for enhancing the bearing capability of sheet pile

walls, which comprises a front sheet pile wall, a back anchoring wall and an anchoring draw rod, wherein the front sheet pile wall is connected with the back anchoring wall by the anchoring draw rod; a plurality of half curtain piles which are parallel with the front sheet pile wall are arranged behind the front sheet pile wall, and the distances between the half curtain piles and the front sheet pile wall are at 1-10 M; the bottoms of the half curtain piles are below the bottom of the front sheet pile wall; the spaces of the front sheet pile wall, the half curtain piles and the back anchoring wall are filled with earth bodies or existing earth bodies. The utility model has the effects that the utility model can effectively decrease the stress of the front sheet pile, and create the condition that sheet pile wharf quaywalls can enlarge water depth. For the deepening and improvement project of sheet pile wharves, the utility model can avoid dismantling structures which built above the wharf surface layers, thereby, the utility model furthest saves investment, reduces the construction period and decreases the producing influence. When the wharves are deepened, front edge lines need not be pushed to move forwards and the utility model avoids the influence of water area when the wharves are deepened. The half curtain piles all are constructed on ground, have short construction period and low cost and do not influence ships to park at the wharves.

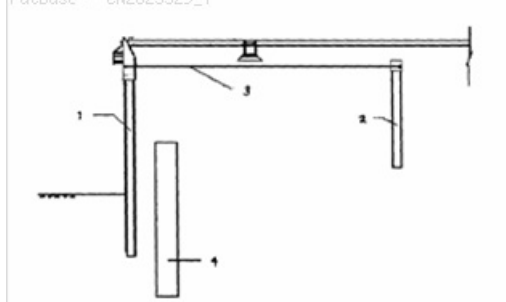
Classifications:

International (IPC 8-9): E02B3/04 E02D27/30

E02D5/02 (Advanced/Invention);

E02B3/04 E02D27/00 E02D5/02 (Core/Invention)

PatBase - CN2823329_Y



Family:

Publication number	Publication date	Application number	Application date
CN2823329 Y	20061004	CN200520123117U	20051117

Priority:

CN200520123117U 20051117

Probable Assignee: ZHONGJIAO NO 1 SHIPPING ENGINE

Assignee(s): (std): ZHONGJIAO NO 1 SHIPPING ENGINE

Assignee(s): ZHONGJIAO NO 1 SHIPPING ENGINEERING PROSPECTING DE ; ZHONGJIAO NO 1 SHIPPING ENGINEERING PROSPECTING DESIGN INST ; ZHONGJIAO NO1 SHIPPING ENGINEERING PROSPECTING DES

Inventor(s): (std): DONG WENCAI ; LI YUANYIN ; LIU YONGXIU ; SHEN LIMING ; WANG CHENGHUAN ; WU LIDAN ; ZHU JIQUAN

Inventor(s): CHENGHUAN WANG ; YONGXIU LIU ; YUANYIN LI ; WENCAI DONG ; LIDAN WU ; LIMING SHEN ; JIQUAN ZHU

15) Family number: 63007882 (CN205636787U)

© PatBase

Title: DEEP CEMENT OF M SHAPE STIRRING RETAINING STRUCTURE

Abstract: The utility model discloses a deep cement of m shape stirring retaining structure, its characterized in that, this retaining structure's aspect is continuous m shape, is equipped with arch diaphragm wall and limb wall, adopts the arch diaphragm wall play the arch face as the compression face be equipped with one on every hunch foot of arch diaphragm wall the limb wall. The utility model discloses the CDM body to traditional is optimized, adopts m shape structure, and make full use of cement stirs the characteristics of body material to reasonable type of construction reaches the reinforcement effect to weak soil bank slope, simultaneously reduce project cost. Can effectual reinforcement create pier and sloping at labour pier weak soil bank, engineering cost is lower, and the construction is simple.

Classifications:

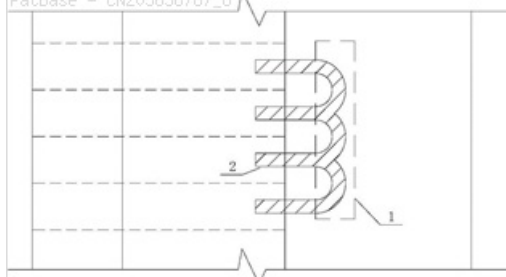
International (IPC 8-9): E02B3/06 E02D17/20

E02D29/02 (Advanced/Invention)

CPC: E02D29/02 E02B3/068 E02D17/20 E02D2200/16

E02D2300/0023

PatBase - CN205636787_U



Family:

Publication number	Publication date	Application number	Application date
CN105804114 A	20160727	CN201610223656	20160412
CN205636787 U	20161012	CN201620308274U	20160412

Priority:

CN201610223656 20160412 CN201620308274U 20160412

Probable Assignee: TIANJIN RES INST WATER TRANSP ENG MOT

Assignee(s): (std): TIANJIN RES INST FOR WATER TRANSP ENG M O T ; TIANJIN RES INST WATER TRANSP ENG MOT

Assignee(s): TIANJIN INST OF WATER TRANSPORT ENGINEERING SCIENCE DEPARTMENT OF TRANSPORTATION ; TIANJIN RESEARCH INST FOR WATER TRANSPORT ENGINEERING MOT

Inventor(s): (std): LI TIELIANG ; LI YING ; LI YUESONG ; LIU HONGBIAO ; LIU XIANPENG ; SUN XIPING ; YIN JILONG ; ZHANG GAN ; ZHANG QIANG