

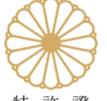
Auto floodgate with power-less water back-flow prevention (prototype)



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特許證

Worldwide first **patented** product
New flood-prevention technique No. 2016-8

Manless power-less floodgate

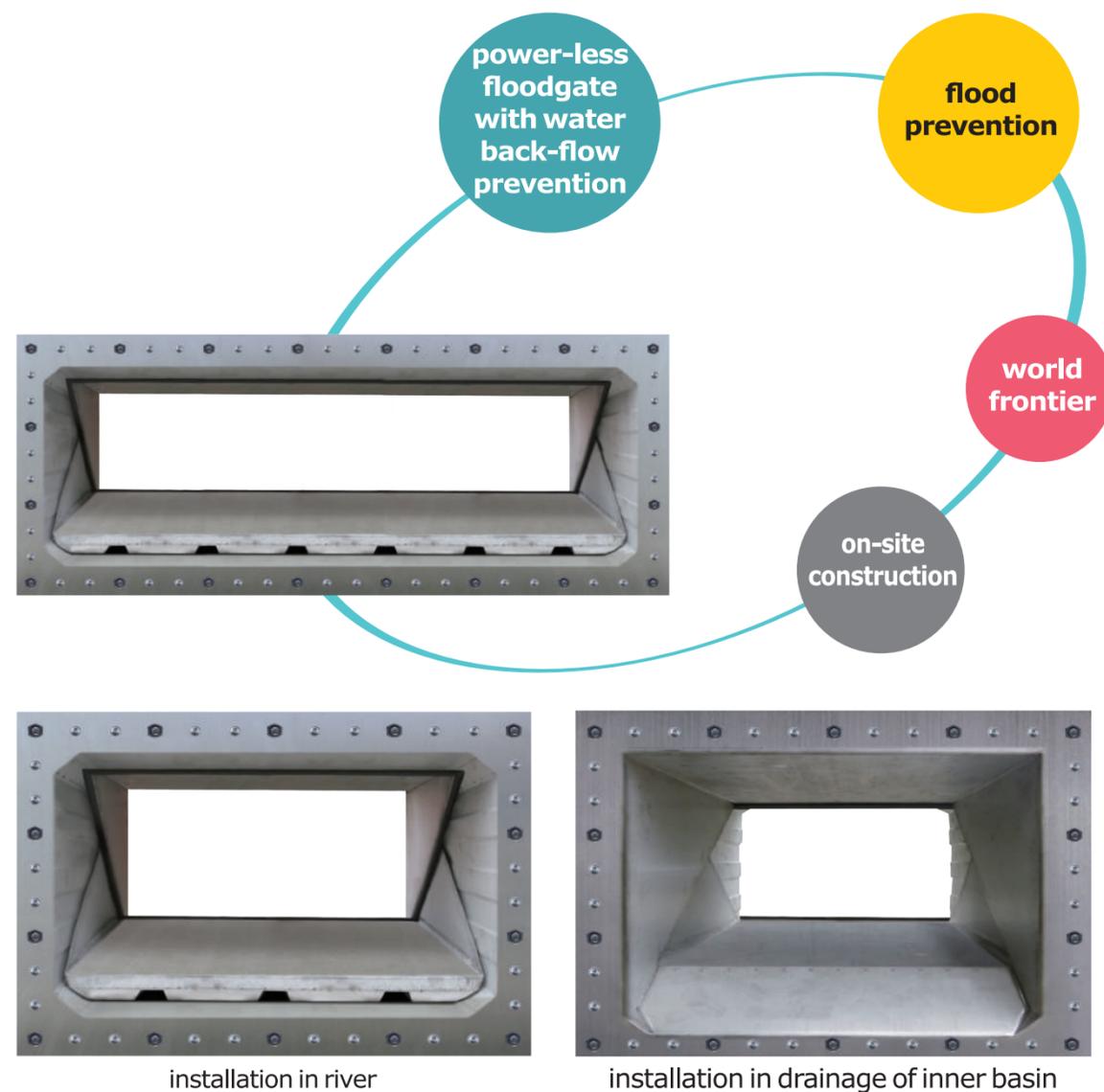
Unmanned automatic floodgate with power-less back-flow prevention



KR KOREA MACHINERY IND. INC.

Welcome

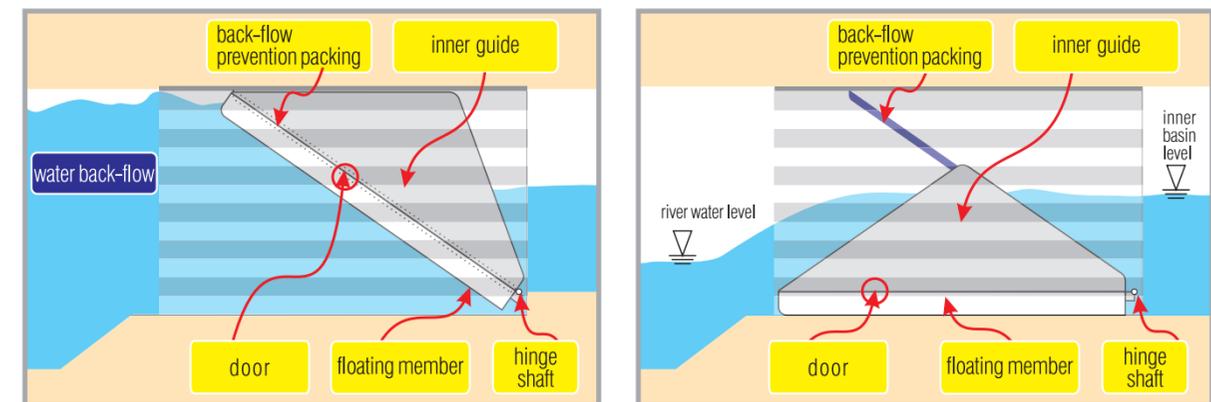
Our company, Korea Machinery IND. INC. has reached & developed a power-less floodgate with water back-flow prevention since 2000 year, which, finally, is patented in Korea, Japan and United States first worldwide. Currently, a global warming leads to more frequent intensive rainfall, typhoon, hurricane, squall, etc. This may increase floods in farmlands, houses, etc. In this connection, our power-less eco-friendly floodgate with water back-flow prevention may suppress the floods, thereby to keep a personal safety and property. Korea Machinery IND. INC will promise providing the power-less eco-friendly floodgate with water back-flow prevention with a high and reliable quality.



Overview of present floodgate

The floodgate with powerless back-flow prevention includes a body having a water inlet at a front thereof, a water outlet at a rear thereof, a door pivotally coupled to the body, wherein the door comprises a number of floating members, each floating member being configured to generate a floating force using a back-flow of water toward the outlet; and a guide disposed on the floating members to pivot upwards via the floating force to close the outlet, and to pivot downwards via a gravity in an absence of the water back-flow to open the outlet, and, then to guide the water from the outlet, wherein the guide comprises: a guide plate disposed on the floating members to guide the water from the outlet; and side blocking plates extending upwards from the guide plate at both side ends thereof respectively to guide the water from the outlet. This powerless pivotal upward and downward movement of the door may close the outlet to suppress the back-flow of the water and may open the outlet to allow the water to flow forwardly.

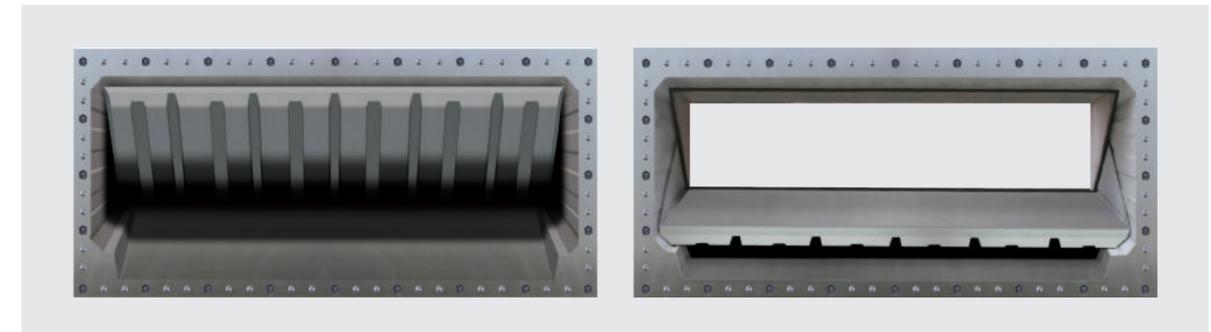
Configuration & operational principle of present floodgate



Installation of present floodgate in river, a seashore, etc.



Tetragonal shape power-less floodgate with water back-flow prevention (product)



Examples:

installations of prevent floodgates in large-sized sewage channels for seashore, river bank, drainage of inner basin, and agricultural land respectively.



△Tetragonal shape : 6.0m×3.0m



△Tetragonal shape : 6.0m×3.0m



△Circular shape : ø1.2m



△Circular shape : ø1.0m

Activities

	installations & activities	contracting date
12	Installation of present floodgate in first water supply location in Guro-gu in Seoul, Korea	2016. 07
11	Repairing of sewage channels in Geumdang district in Suncheon-si, Korea	2016. 04
10	Flood prevention construction in Deadong-myeon, Korea	2016. 04
9	Flood prevention construction in frequently submerged area in Chogye, Korea (Secondary)	2015. 12
8	Drainage improvement in SamHak district, Korea (Secondary)	2014. 12
7	Flood prevention construction in densely house-occupied area in Sanje, Korea	2014. 12
6	Food prevention construction in densely house-occupied area in Myosan, Korea	2014. 12
5	Flood prevention construction in frequently submerged area in Chogye, Korea (Primary)	2014. 12
4	Drainage improvement in SamHak district, Korea (Primary)	2014. 11
3	Flood prevention construction in Opo-ri, Korea	2014. 10
2	Flood prevention construction in frequently submerged area in Gonjiam, Korea	2014. 09
1	Installation of present floodgate in agricultural water channel in Changan-ri, Korea	2014. 09

Analysis of applications of present floodgate

(published on October 30, 2105 by Korean Society of Civil Engineers)



◆Door closing or opening based on variations of inner/outer water levels

Inner water level	Outer water level	Door height	Remark	Inner water level 0cm~Outer water level 10cm
0cm	0cm	0cm		
	10cm	14cm		
	20cm	29cm		
	30cm	38cm	Full close	
	40cm	-		
10cm	0cm	0cm		
	0cm	13cm		
	10cm	29cm		
	20cm	38cm	Full close	
	30cm	-		
20cm	40cm	0cm		
	0cm	12cm		
	10cm	25.5cm		
	20cm	38cm	Full close	
	30cm	-		
30cm	40cm	0cm		
	0cm	11.5cm		
	20cm	22cm		
	30cm	36cm		
	40cm	38cm	Full close	
40cm	0cm	0cm		
	10cm	11cm		
	20cm	21.5cm		
	30cm	35.5cm		
	40cm	38cm	Full close	

◆Results from variations of rising speed of outer water level

Rising speed of outer water level	Rising speed of door	Remark
10cm/min	12cm/min	
20cm/min	24cm/min	
40cm/min	60cm/min	
50cm/min	70cm/min	

◆Results from variations of rising speed of outer water level

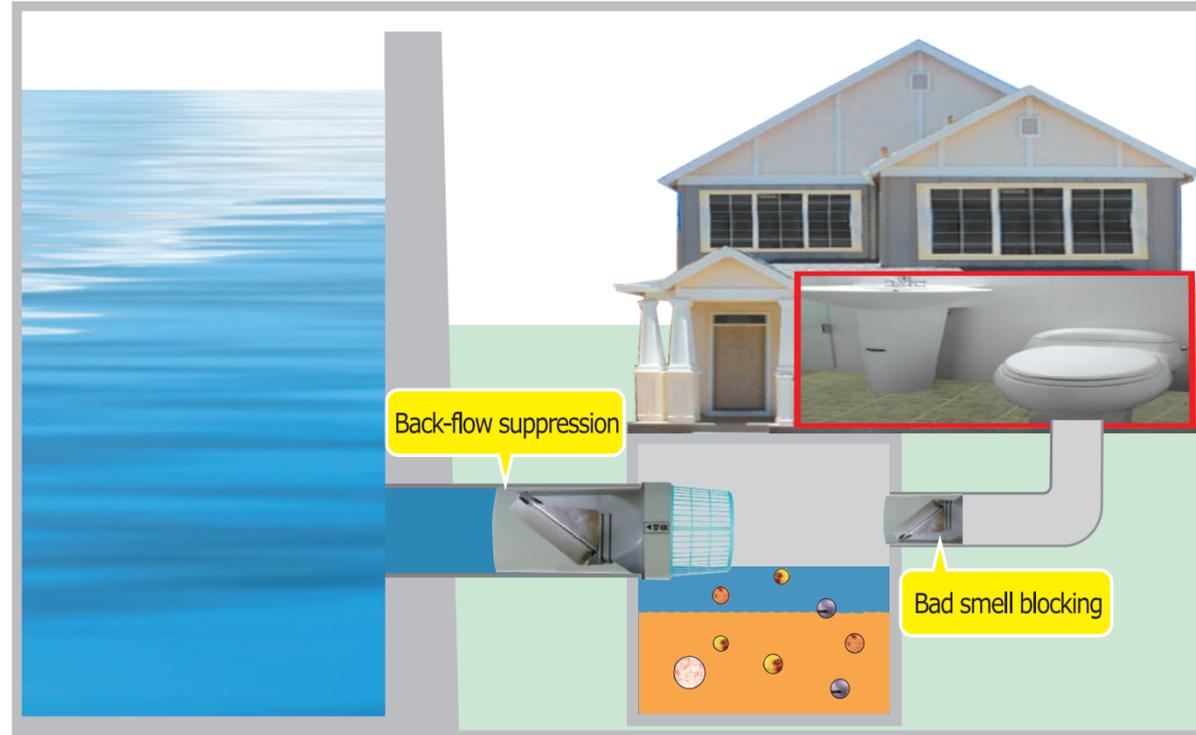
Low rate in inner side of levee (Q /sec)	Inner water level (cm)	Door height (cm)	Outer water level (cm)	Remark
11	15	0	0	
	15.5	5.5	5	
	16	11.5	10	
	20	15.5	15	
	25	21	20	
	30	26	25	
	34.5	30	30	
	38	32.5	35	
	-	-	40	full
	21	19	0	0
19.5		5.5	5	
20		11	10	
23		16	15	
28		21	20	
34		25	25	
38		28	30	full
-		-	35	
-		-	40	
32		21.5	0	0
	22	6	5	
	22.5	11.5	10	
	25	15	15	
	32	20	20	
	36	24	25	
	38	27	30	full
	-	-	35	
	-	-	40	

*Based on experiments regarding back-flow prevention and water-tightness due to rising of an outer water level, the door is closed 2 to 10 cm above the outer water level to prevent the water back-flow. In a completely closed state of the door, the outer water may not leak or invade due to a rubber packing.

*A closing speed of the door is faster 2 cm/min to 20 cm/min than the rising speed of the outer water level, thereby to suppress the back-flow.

*The door may be automatically and/or naturally (namely, in a power-less manner) adapted to be opened or closed in accordance with changes in river environmental conditions. The door may be automatically and/or naturally (namely, in a power-less manner) adapted in an amount of opening or closing thereof, to the change in the inner water amount to ensure the same water level therebetween.

Applications of present power-less back-flow prevention mechanism to house, building, sewage disposal tank, public sewage pipe, etc.



Power-less back-flow prevention mechanism for sewage disposal tank and/or collecting well



Configuration & operational principle

*The powerless back-flow prevention mechanism includes a body having a water outlet at a rear thereof, and a door pivotally coupled to the body, wherein the door comprises a number of floating members, each floating member being configured to generate a floating force using a back-flow of water toward the outlet. The floating members pivot upwards via the floating force to close the outlet, and pivot downwards via a gravity in an absence of the water back-flow to open the outlet. This power-less pivotal upward and downward movement of the door may close the outlet to suppress the back-flow of the water and may open the outlet to allow the water to flow forwardly.

*The powerless bad-smell blocking mechanism includes a body having a water outlet at a rear thereof, and a door pivotally coupled to the body, wherein the door comprises a number of floating members, each floating member being configured to generate a floating force using a back-flow of water toward the outlet. The floating members pivot upwards via the floating force to close the outlet to block the back-flow of the bad-smell, and pivot downwards via a gravity in an absence of the water back-flow to open the outlet, to allow the discharge of the water.

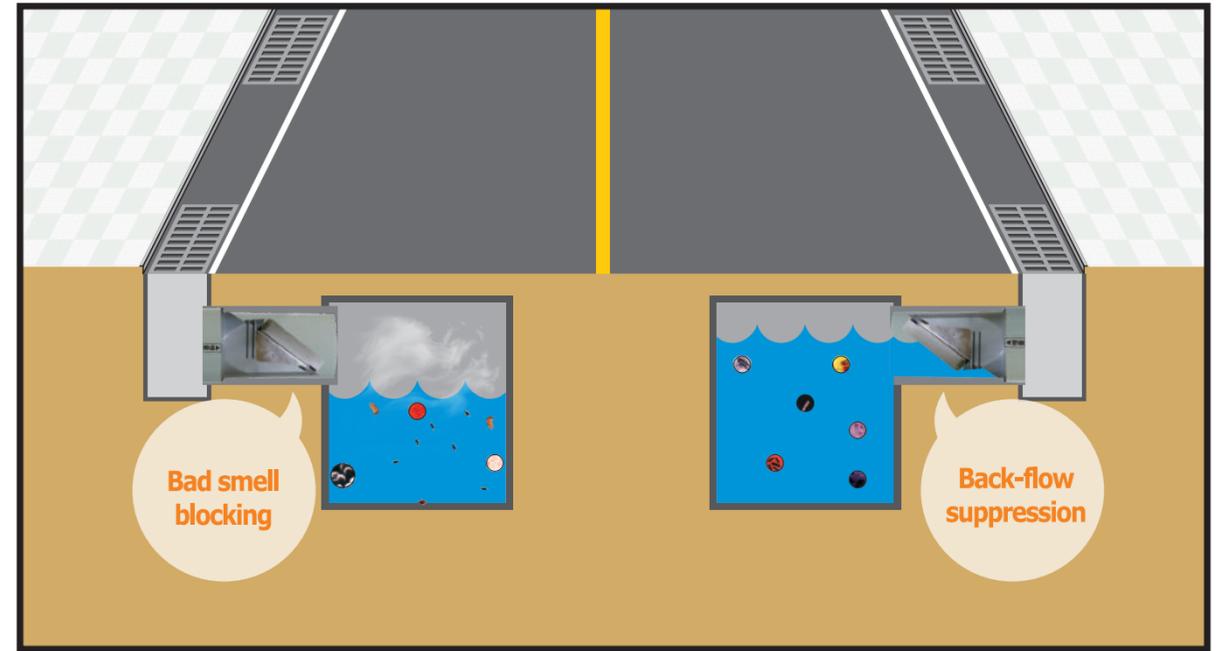
Power-less bad-smell blocking mechanism for sewage disposal tank and/or collecting well



Product characteristic

Normally, the sewage channel is closed to block a flow of a bad-smell or insects backwardly. The silicon packing (in a C shape) completely prevents a leak of the sewage water. STS304, synthetic resin, and packing may be made of EPDM material, which may be nearly permanent.

Applications of present power-less back-flow prevention and/or bad-smell blocking mechanism to road (drainage well)



Certificates of new disaster-prevention technique and worldwide patents of present invention

