

LIQUID BARRIER ASSEMBLY AND CONNECTOR THEREFOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a liquid barrier assembly and connector therefor for the prevention of flow of liquid from one area to an adjacent area and more particularly, but not exclusively, to such an assembly and connector for controlling the passage of fluvial or tidal water in areas prone to flooding.

2. Description of the Related Art

In England and Wales, approximately 5 million people, in 2 million properties, currently live in flood risk areas and 25 people have died as a result of flooding during 1999 and 2000. The Environment Agency of England and Wales estimates that over the coming century, sea levels are expected to rise by as much as half a metre as glaciers and snowfields melt due to changes in the global climate. As sea levels rise, so to will levels of rainfall and water levels in streams and rivers. Consequentially, larger areas of land, not only across the UK but throughout the world, will be placed under a greater risk of flooding and water damage of various kinds.

A great need therefore exists for a cost-effective, flexible and efficient method of water management that is capable of protecting valuable land and other resources as the threat of flood damage increases.

The most well-known method of retaining flood water involves constructing barriers composed of sandbags. Although this method is still widely used, it suffers from several disadvantages. One disadvantage is the amount of labour involved in filling and locating each bag. Another disadvantage is the high number of sandbags required to construct a wall of sufficient size for even relatively small levels of flooding. A further disadvantage is the arduous nature of the task of dismantling the wall after the flooding has subsided. When combined, these disadvantages serve to make the use of sandbags an extremely labour-intensive, costly and time-consuming process. Consequentially, alternative methods of water management have been proposed.

One example of an alternative water management system is a water-inflated barrier marketed by Aqua-Barriers™ and described in U.S. Pat. No. 5,865,564. This system uses large water-inflatable barriers to form coffer dams. Each barrier is typically between 50 and 100 foot long, produced with a flexible laminate structure comprising a base of woven polyester sandwiched between two layers of polyvinyl chloride and is formed as a single hollow tube with a perforated inner restraint diaphragm running along its length, designed to prevent it from rolling when in use. Additionally, each barrier can be joined to others to form longer structures if required. A disadvantage of this system is the need to evaluate various parameters, such as slope and grade, water depth, water velocity, anticipated water flows and related hydrological standards, prior to siting. Furthermore, expert advice is required to locate each barrier, significantly increasing both the cost and complexity of deploying the system.

Another example of a water management system is the Water Gate™ system marketed by MegaSecur Inc. This system uses barriers, each of which comprises a flexible plastic sheet constructed with a plurality of pockets. The plastic sheet is folded in a specific arrangement when not in use. When required each barrier is sited at a desired location and a securing "bib" manually unfolded. Gravel or sandbags are then placed on top of the "bib" to anchor each barrier in position. The remaining sheets that make up each barrier are

allowed to unfold under the pressure of water incident upon them and the pockets open and fill with water to form a dam across the river. Each barrier can be joined to others to form longer structures if required. A disadvantage of this system is the potentially unreliable means by which each sheet is anchored. Another disadvantage, arising from the way in which the barrier is constructed, is that a very large barrier is required to hold back even modest heights of water. For example, a barrier with a depth of 7.4 m is required to retain a head of water 2 m high.

Our co-pending PCT application no. PCT/GB02/02450 describes a flood barrier assembly comprising a plurality of hollow barriers each with an aperture in its front face. In use, the barriers are connected together and sealed to each other to prevent the passage of water across them. An aperture in the front wall of each barrier permits water to enter the barrier thereby providing additional stability. Our co-pending UK patent application no. 0305758.5 discloses an alternative flood barrier assembly similar to that described in PCT/GB02/02450 which additionally comprises a flexible membrane secured to the front wall of the barriers by a plurality of porous connectors received in apertures defined in the front wall of the barriers.

In spite of the advantages provided by the assemblies described in our earlier patent applications a need still exists for a flexible, secure and water-tight means for connecting adjacent flood barriers to provide an improved flood barrier assembly. Furthermore, a need exists for a reliable means of securing flood barriers to the ground on which they are located.

The object of the present invention is to provide an assembly and associated connector suitable for water management and to obviate or mitigate the above-identified disadvantages.

SUMMARY OF THE INVENTION

According to a first aspect of the present invention there is provided a liquid barrier assembly for the prevention of flow of liquid from one area to an adjacent area, the assembly comprising first and second barriers each comprising a substantially rigid container, each barrier having a front wall against which, in use, liquid is intended to be incident, a base wall which is intended to be in contact with a support surface on which the barrier is to be located, and first and second opposite side walls each having a side groove defined therein, adjacent barriers being connectable to one another by a connector to form a liquid-tight seal between the barriers, wherein the connector comprises a first portion disposed in a first of said side grooves in the first barrier and a second portion projecting from said first of said side grooves, the first portion defining at least one resiliently deformable locking projection for locking engagement with a surface of the first side groove, the second portion being resiliently deformable and defining a plurality of resiliently deformable sealing projections, and wherein when the barriers are juxtaposed in a predetermined manner the second portion of the connector is received in a second groove of the second barrier and compressed such that it undergoes a predetermined deformation so that at least one of the sealing projections is forced towards a surface of the second side groove defined in the second barrier so as to form a liquid-tight seal therewith.

The assembly provides a secure and reliable manner by which the flow of liquid between areas may be controlled. It will be evident that the inventive assembly is particularly suitable for use as a flood barrier. For example, it may be installed in proximity to a river in an area where there is a