[Claim 1]

A crack detection monitoring device comprising:

a hollow housing member comprising a first opening portion having a first area and a second opening portion having a second area larger than the first area;

a first fixing member having a lower portion installed on a structure, and an upper portion inserted the hollow housing member through the first opening portion, and a cross-sectional area corresponding to the first area;

a second fixing member having a lower portion installed on a structure, and an upper portion inserted the hollow housing member through the second opening portion, and a cross-sectional area smaller than the second area;

~~first and second fixing members each having a lower portion installed on a structure, and an upper portion inserted into the housing member;~~

a connection member provided on a lower surface in the housing member, and which the first fixing member and the second fixing member are coupled;

at least one or more movable members coupled to the connection member and configured to move in response to a change in width between the first and the second fixing members that is caused by a crack in the structure; and

at least one or more detection units provided in the housing member and provided to respectively correspond to the at least one or more movable members.

[Claim 2]

~~The crack detection monitoring device of claim 1, wherein the housing member comprises:~~

~~a first opening portion having an area corresponding to a cross-sectional area of the first fixing member and provided in a first region of a lower portion of the housing member and the first fixing member is inserted into the first opening portion; and~~

~~a second opening portion having an area larger than a cross-sectional area of the second fixing member provided in a second region of the lower portion of the housing member and the second fixing member is inserted into the second opening portion.~~

[Claim 2~~3~~]

The crack detection monitoring device of claim 1, wherein the at least one or more movable members comprise:

at least one or more vertical movable bodies coupled to one side of the connection member in a direction perpendicular to the connection member; and

at least one or more horizontal movable bodies each provided at the other side of each of the at least one or more vertical movable bodies.

[Claim 34]

The crack detection monitoring device of claim 23, wherein the at least one or more movable members comprise at least one or more rotary bodies configured to connect each of the at least one or more horizontal movable bodies to each of the at least one or more vertical movable bodies so that the at least one or more horizontal movable bodies are rotatable.

[Claim 45]

The crack detection monitoring device of claim 1, further comprising:

a fixing clip member coupled to an outer surface of the housing member and installed on the structure.

[Claim 56]

The crack detection monitoring device of claim 45, wherein the housing member has coupling grooves having predetermined depths formed at two opposite sides of the outer surface,

wherein the fixing clip member has a U shape,

wherein fixing protrusions are respectively formed on two opposite inner surfaces of the fixing clip member and coupled to the coupling grooves, and

wherein a lower portion of the fixing protrusion is installed on the structure.

[Claim 67]

A crack detection monitoring device comprising:

a hollow housing member comprising a first opening portion having a first area and a second opening portion having a second area larger than the first area;

a first fixing member having a lower portion installed on a structure, and an upper portion inserted the hollow housing member through the first opening portion, and a cross-sectional area corresponding to the first area;

a second fixing member having a lower portion installed on a structure, and an upper portion inserted the hollow housing member through the second opening portion, and a cross-sectional area smaller than the second area;

~~first and second fixing members each having a lower portion installed on a structure, and an upper portion inserted into the housing member;~~

a connection member provided on a lower surface in the housing member, and which the first fixing member and the second fixing member are coupled;

a plurality of movable members coupled to the connection member and configured to move in response to a change in width between the first and the second fixing members that is caused by a crack in the structure; and

a plurality of detection units provided in the housing member and provided to respectively correspond to the plurality of movable members.

[Claim 7~~8~~]

The crack detection monitoring device of claim 6~~7~~, wherein the plurality of movable members are spaced apart from one another at predetermined intervals.

[Claim 8~~9~~]

The crack detection monitoring device of claim 7~~8~~, wherein the plurality of movable members are provided rearward of the second fixing member and spaced apart from one another at predetermined intervals, and the rearward direction of the second fixing member is a direction that is not directed toward the first fixing member from the second fixing member.

[Claim 9~~10~~]

The crack detection monitoring device of claim 6~~7~~, wherein the plurality of movable members have different lengths.

[Claim 10~~11~~]

The crack detection monitoring device of claim 9~~10~~, wherein the plurality of detection units are provided on the same vertical line.

[Claim 11~~12~~]

The crack detection monitoring device of claim 6~~7~~, wherein the plurality of movable members have lengths corresponding to one another.

[Claim 12~~13~~]

The crack detection monitoring device of claim 11~~12~~, wherein the plurality of detection units are different in positions.

[Claim 13~~14~~]

A crack detection monitoring system comprising:

the crack detection monitoring device according to any one of claims 1 to 12~~to 13~~;

a relay device configured to receive a signal transmitted from the crack detection monitoring device;

a network device configured to receive the signal transmitted from the relay device; and

an application device configured to receive the signal transmitted from the network device, analyze the signal, store the signal as processing data, and provide the processing data to an external device.