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Fixing device for firefighting pipe

Abstract

A vertical firefighting pipe (**2**) is holdable in a seating part (**14**) of a holder (**10**) next to a horizontal square pipe (**1**) insertable between a side plate (**13**) and a guide pin (**31**) in the holder, the firefighting pipe holdable in the seating part by a fastening screw (**50**) in a pressing plate (**40**) insertable between a pressing plate guide pin (**30**) and a cover plate (**20**) of the holder.

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References Cited

U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
8491061	12/2012	Breault	299/95	E21F 17/02
9308407	12/2015	Jung	N/A	F16L 3/003
2010/0237201	12/2009	Oh	248/74.2	B05B 15/62
2020/0078625	12/2019	Mitchell et al.	N/A	N/A

FOREIGN PATENT DOCUMENTS

Patent No.	Application Date	Country	CPC
07-035267	12/1994	JP	N/A
10-0441679	12/2003	KR	N/A
20-0410594	12/2005	KR	N/A
10-1813010	12/2016	KR	N/A
10-2019-0093920	12/2018	KR	N/A

OTHER PUBLICATIONS

Bibliographic Data including English Abstract for KR patent application No. 1020010080731 cited as Patent Document 1 at paragraph [05] on p. 3 of the substitute specification (see Foreign Patent Document Cite No. 1), 2 pages. cited by applicant

Bibliographic Data including English Abstract for KR patent application No. 1020180013336 cited as Patent Document 2 at paragraph [06] on p. 3 of the substitute specification (see Foreign Patent Document Cite No. 2), 3 pages. cited by applicant

Translation of the International Search Report (ISR) for International Application No. PCT/KR2021/003671, mailed Jul. 20, 2021, 3 pages. cited by applicant

Bibliographic Data including English Abstract for KR patent publication No. 10-1813010 B1 as Foreign Patent Document Cite No. 4, 1 page. cited by applicant

Bibliographic Data including English Abstract for KR patent publication No. 20-0410594 Y1 as Foreign Patent Document Cite No. 5, 1 page. cited by applicant

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Background/Summary

BACKGROUND OF THE INVENTION

Field of the Invention

(1) The present invention relates to a fixing device for a firefighting pipe, and more specifically, to a firefighting pipe fixing device for conveniently fixing an end portion of a firefighting pipe, on which a sprinkler is mounted, on a bar installed on the ceiling of a building.

Background Art

(2) In case of fire, sprinklers are mounted at regular intervals to spray firewater from the ceiling of a building. An end portion of a firefighting pipe is connected to each sprinkler, and is fixed by using various structures pre-installed on the ceiling of the building. Of course, in a case in which there is no proper structure on which the firefighting pipe is installed, a separate frame can be constructed. Hereinafter, a structure installed on the ceiling of a building will be described. Such a structure may include a square pipe illustrated in FIG. **1**.

(3) FIG. **1** illustrates an installed state of a fixing device for fixing an end portion of a firefighting pipe **2** to a square pipe **1** installed on the ceiling. The fixing device includes: a bracket **100** having an upper plate **110**, a lower plate **120** and a side plate **130** by being bent in the form of a “  ” shape; round holes **111** respectively perforated in the upper plate **110** and the lower plate **120** so that a firefighting pipe **2** having a sprinkler **3** mounted at an end thereof can be inserted into the round holes **111**; and two fixing screws **140** screw-coupled to the side plate **130** so as to press and fix the firefighting pipe **2** by the square pipe **1** inserted into a space between the upper plate **110** and the lower plate **120**.

(4) In order to insert the firefighting pipe **2** into the round holes **111** of the upper plate **110** and the lower plate **120**, the firefighting pipe **2** must be at right angles to the upper plate **110** and the lower plate **120**, and the upper portion must secure a space in some degree. However, it is difficult to easily perform work since the firefighting pipe is installed in a limited space of the ceiling. Moreover, since the firefighting pipe **2** on which the sprinkler **3** is mounted is connected to a main pipe, it is difficult to freely control the firefighting pipe **2**, namely, it is inconvenient to fix the firefighting pipe **2** since it is not easy to exactly insert the firefighting pipe **2** into the round holes **111**.

PATENT LITERATURE

Patent Documents

(5) Patent Document 1: Korean Patent Application No. 10-2001-0080731

(6) Patent Document 2: Korean Patent Application No. 10-2018-0013336

SUMMARY OF THE INVENTION

(7) Accordingly, the present invention has been made to solve the above-mentioned problems occurring in the prior art, and it is an object of the present invention to provide a firefighting pipe fixing device for fixing an end portion of a firefighting pipe, to which a sprinkler is connected, on a square pipe installed on the ceiling of a building. In more detail, an object of the present invention is to provide a firefighting pipe fixing device capable of minimizing movement of a firefighting pipe and conveniently fixing the firefighting pipe.

(8) To accomplish the above object, according to the present invention, there is provided a firefighting pipe fixing device for vertically fixing a firefighting pipe to a square pipe horizontally fixed and mounted near the ceiling of a building, the firefighting pipe fixing device including: a holder having an upper plate, a lower plate and a side plate by being bent in the form of a “  ” shape, and a square pipe insertion path through which the square pipe passes; pipe seating parts formed in the upper plate and the lower plate in a “∩” shape so as to be open at one side and to have a width into which the firefighting pipe is inserted; a pipe pressing part inserted into the pipe seating parts for closely fixing the firefighting pipe, which perpendicularly passes through the upper plate and the lower plate, to the side surface of the square pipe inserted into the square pipe insertion path, wherein the pipe pressing part comprises: a cover plate fixed at

end portions of the upper plate and the lower plate of the holder to be parallel with the side plate; a pressing plate inserted into the holder to be located between the firefighting pipe and the cover plate; and a fastening or fixing screw to be screw-coupled to the pressing plate so that the front end presses the side wall of the firefighting pipe.
(9) According to another feature of the present invention, the pressing plate is inserted into the holder in a sliding manner and pressing plate guide pins are mounted between the upper plate and the lower plate in order to guide the direction that the pressing plate is inserted.
(10) According to another feature of the present invention, the cover plate has a guide groove formed in the horizontal direction so that the fixing screw can move in a state in which the fixing screw is coupled to the pressing plate.
(11) According to another feature of the present invention, the pressing plate has a stopper protruding at an end thereof to accurately locate the fastening screw at the center of the opening portions so as to limit the length that the pressing plate is inserted.
(12) According to an embodiment of the present invention, the firefighting pipe fixing device can conveniently and rapidly fix the end portion of the firefighting pipe, to which the sprinkler is connected, on the square pipe installed on the ceiling of a building. In more detail, a worker can fix the firefighting pipe just by slightly moving the firefighting pipe in the back-and-forth direction without moving it in the vertical direction, so that the end portion of the firefighting pipe on which the sprinkler is mounted can be easily fixed.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
(1) The above and other objects, features and advantages of the present invention will be apparent from the following detailed description of the preferred embodiments of the invention in conjunction with the accompanying drawings, in which:
(2) FIG. **1** is a perspective view illustrating an installed state of a conventional firefighting pipe fixing device;
(3) FIG. **2** is a partially exploded perspective view of a firefighting pipe fixing device according to an embodiment of the present invention;
(4) FIG. **3** is a perspective view illustrating an installed state of the firefighting pipe fixing device according to the embodiment of the present invention; and
(5) FIG. **4** is a cross-sectional view taken along the line of A-A of FIG. **3**.
DETAILED DESCRIPTION
(6) Hereinafter, with reference to the attached drawings, an embodiment of the present invention will be described in detail with reference to FIGS. **2** to **4**.
(7) A firefighting pipe fixing device according to an embodiment of the present invention is to vertically fix a firefighting pipe **2** to a square pipe **1** horizontally fixed and installed near to the ceiling of a building. Especially, the firefighting pipe **2** may be an end portion of the firefighting pipe on which a sprinkler **3** is mounted. However, with respect to a specific use purpose, the end portion of the firefighting pipe is just an example, and the firefighting pipe fixing device according to the present invention is not limited thereto.
(8) The firefighting pipe fixing device according to the embodiment of the present invention includes a holder **10**, a pipe seating part **14**, and a pipe pressing part.
(9) The holder **10** having a square pipe insertion path is formed by bending a metal plate in the form of a “custom character” shape. The holder **10** includes an upper plate **11**, a lower plate **12**, and a side plate **13**. The thickness of the holder **10** which corresponds to the height of the side plate **13** corresponds to the length of one side of the square pipe so that the square pipe can pass through.
(10) The upper plate **11**, the lower plate **12** and the side plate **13** of the holder **10** respectively get in

contact with three sides of the square pipe **1** having a square cross section.
(11) In order to guide the length to which the square pipe **1** is inserted, a square pipe guide pin **31** may be mounted. The square pipe guide pin **31** may be provided in a plural number in such a way that an upper end of the square pipe guide pin **31** is connected to the upper plate **11** and a lower end is connected to the lower plate **12**.
(12) The pipe seating part **14** (see FIG. **2**) is provided such that the firefighting pipe **2** is seated and fit to the holder **10** to be in the perpendicular direction to the square pipe **1**. The pipe seating part **14** has opening portions **111** and **121** respectively formed in the upper plate **11** and the lower plate **12** in a "∩" shape to be opened at one side and to have a width W into which the firefighting pipe **2** is inserted. A linear distance L ranging from the side plate **13** of the holder **10** to start points of the opening portions **111** and **121** is shorter than the length of one side of the square pipe **1**.
(13) Through the above structure, the square pipe **1** can be inserted in parallel with the holder **10**, and the firefighting pipe **1** can be inserted in the perpendicular direction to the holder **10**. Especially, according to the present invention, the firefighting pipe **1** is moved in the perpendicular direction to the upper and lower plates **11** and **12** of the holder **10**, namely, in the arrow direction (D) of FIG. **2**, so as to be seated on the holder **10**.
(14) The pipe pressing part is a means for closely fixing the firefighting pipe **2** perpendicularly passing through the upper plate **11** and the lower plate **12** to the side of the square pipe **1** inserted into the square pipe insertion path.
(15) The pipe pressing part includes cover plates **20** and **20′**, a pressing plate **40**, and a fastening screw **50**. The cover plates **20** and **20′** are fixed while surrounding end portions of the upper plate **11** and the lower plate **12** of the holder **10** to be in parallel with the side plate **13**. Of course, the cover plates **20** and **20′** are mounted not to hide the opening portions **111** and **121**. The cover plates **20** and **20′** may be fixed by welding, and as occasion demands, may be provided integrally with the upper and lower plates **11** and **12**.
(16) The pressing plate **40** is inserted into the holder **10** in such a way as to be interposed between the firefighting pipe **2** seated on the pipe seating part and the cover plates **20** and **20′** fixed at the end portions of the upper and lower plates **11** and **12**. The pressing plate **40** is inserted into the holder **10** in the same direction K as an extension direction of the square pipe **1**.
(17) As illustrated in the drawings, the pressing plate **40** has a cross section formed in a "custom character" shape in the longitudinal direction. The pressing plate **40** has a screw hole **41** for fastening the fastening screw **50**.
(18) The fastening screw **50** is screw-coupled to the screw hole **41** of the pressing plate **40** so that the front end of the fastening screw **50** presses the side wall of the firefighting pipe **2** according to a coupling degree.
(19) The pressing plate **40** is inserted into the holder **10** in a sliding manner. In order to guide the direction that the pressing plate **40** is inserted, pressing plate guide pins **30** are mounted between the upper plate **11** and the lower plate **12**. The pressing plate guide pins **30** serve to guide the pressing plate **40** and fix one of the cover plates to the upper and lower plates **11** and **12**.
(20) According to the present invention, the cover plate **20** or **20′** has a guide groove **21** formed in the horizontal direction, namely, in a direction parallel to the upper and lower plates **11** and **12**, so that the fixing screw **50** can move in a state in which the fixing screw **50** is coupled to the pressing plate **40**.
(21) Now, a using method of the fixing device for the firefighting pipe according to the present invention will be described.
(22) The fixing device for the firefighting pipe according to the present invention is used in a state in which the fixing screw **50** is slightly coupled to the screw hole **41** after the pressing plate **40** is previously inserted into the holder **10**. A worker inserts the fixing screw **50** into the guide groove **21** so that the pressing plate **40** opens the opening portions **111** and **121** to seat the firefighting pipe **2** in the opening portions **111** and **121**.

(23) Thereafter, when the worker removes the fastening screw **50** from the guide groove **21** after seating the firefighting pipe **2** on the pipe seating part, the pressing plate **40** closes the opening portions **111** and **121**. After that, the worker tightens the fastening screw **50** to fix the firefighting pipe **2**.
(24) When the worker tightens the fastening screw **50**, as illustrated in FIG. **4**, the front end of the fastening screw **50** presses one side **2***a* of the firefighting pipe so that the other side **2***b* of the firefighting pipe presses one side **1***a* of the square pipe. Through the above action, the firefighting pipe **2**, the holder **10**, and the square pipe **1** can be fixed relatively.
(25) According to an embodiment of the present invention, the pressing plate **40** has a stopper **42** protruding at an end thereof to accurately locate the fastening screw **50** at the center of the opening portions **111** and **121** so as to limit the length that the pressing plate **40** is inserted.
(26) When the worker pushes the pressing plate **40** in the direction as much as possible to close the opening portions **111** and **121** in the arrow K direction of FIG. **2**, the fastening screw **50** is located at middle points of the opening portions **111** and **121**. Contrariwise, when the worker moves in the direction to open the opening portions **111** and **121** as much as possible, the opening portions **111** and **121** are opened enough to easily insert the firefighting pipe **2**.
(27) The pressing plate **40** has an arc-shaped pipe seating surface **43** on which the firefighting pipe **2** is seated in such a way that the outer surface of the firefighting pipe gets in surface contact with the pipe seating surface **43**. According to another embodiment of the present invention, the firefighting pipe fixing device includes a pressing plate pressurizing part to pressurize the pressing plate **40** toward the firefighting pipe **2**. That is, not the fastening screw **50** but the pressing plate **40** presses the firefighting pipe **2** so that the firefighting pipe **2** can be supported and fixed to the square pipe.
(28) While the exemplary embodiments of the present invention have been described in more detail with reference to the accompanying drawings, but the foregoing is just illustrative of the present invention, and it will be understood by those of ordinary skill in the art that various modifications and equivalents may be made without deviating from the spirit or scope of the invention. For instance, it is to be understood that all embodiments described above may be implemented through free combination by those skilled in the art, and all combinations are intended to be embraced in the scope of the present invention.

Claims

1. A firefighting pipe fixing device for vertically fixing a firefighting pipe to a square pipe horizontally fixed and mounted adjacent a ceiling of a building, the firefighting pipe fixing device comprising: a holder having an upper plate and lower plate parallel to the upper plate joined together by a side plate perpendicular to both the upper plate and the lower plate, and a square pipe insertion path through which the square pipe is passable for resting against the side plate in a rear part of the holder; an upper plate opening portion formed in a front part of the upper plate and facing a lower plate opening portion formed in the lower plate that together provide a seating part in the front part of the holder as matching and aligned arch shaped cut-out openings having a width into which the firefighting pipe is insertable; a pipe pressing part for insertion into the front part of the holder for fixing the firefighting pipe when positioned in the seating part so as to perpendicularly pass through the upper plate and the lower plate facing a side surface of the square pipe when inserted into the square pipe insertion path, wherein the pipe pressing part comprises: a cover plate fixed at end portions of the upper plate and the lower plate of the front part of the holder in parallel with the side plate; a pressing plate for insertion into the holder between the firefighting pipe and the cover plate; and a fastening screw that when screw-coupled to the pressing plate causes a front end of the fastening screw to press a side wall of the firefighting pipe.
2. The firefighting pipe fixing device according to claim 1, wherein the pressing plate is insertable

into the holder in a sliding manner, and wherein pressing plate guide pins are mounted between the upper plate and the lower plate in order to directionally guide insertion of the pressing plate into the holder in the sliding manner.

3. The firefighting pipe fixing device according to claim 1, wherein the cover plate has a guide groove formed in a direction so that the fixing screw is movable to a position where the fixing screw is coupled to the pressing plate.

4. The firefighting pipe fixing device according to claim 1, wherein the pressing plate has a stopper protruding at an end thereof to accurately locate the fastening screw at the center of the opening portions by limiting a length of insertion of the pressing plate.