

Description

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to a piping arrangement according to the preamble of claim 1, as known from BE-A-470.380, and a method of installing pipes for such a piping arrangement.

Description of the Prior Art

Generally, sprinkler heads of this type are arranged in plurality in spaced apart relation so as to enable fire water release to spread generally over the entire room space. Hitherto, it has been known to install pipes for sprinkler head mounting in manner as known from BE-A-470.380 and as shown in FIGS. 7 and 8, for example.

The conventional piping arrangement shown comprises a plurality of auxiliary water-supply pipes 5 led from and arranged in intersecting relation to a main supply pipe 1, and mounting members such as tees 16, elbows 17, 17, and nipples 18 for mounting a plurality of sprinkler heads 15 at specified intervals to each auxiliary water-supply pipe, the mounting members being arranged in a suitable combination between each auxiliary pipe and each individual sprinkler head 15 as shown in FIG. 8.

SUMMARY OF THE INVENTION

In the conventional pipe installing method, it is necessary that each auxiliary pipe 5 must be provided with such number of branch pipes that corresponds to the number of sprinkler heads 15 to be mounted in position, and moreover, as stated above, a large number of parts are required in pipework for connection between each auxiliary pipes 5 and individual sprinkler heads 15. As such, the required piping arrangement is very complicated, and such complicated pipework is required with respect to individual sprinkler heads. This poses a fatal problem that the pipe installing work at the site is very complex and troublesome.

This invention has been developed with a view to solving the foregoing problem with the prior art, and accordingly it is a primary object of the invention to provide a simplified piping arrangement for sprinkler head mounting thereby to minimize the number of parts required for pipe installation and enable a series of pipe-work at the site to be carried out at ease and quickly.

In order to accomplish the foregoing object, according to the invention there is provided a piping arrangement according to the preamble of claim 1 which comprises characterizing features thereof.

The invention also provides a method of installing pipes according to claim 7.

In the method of installing pipes for sprinkler head mounting according to the invention, it is only required

that sprinkler heads are individually connected through flexible joint pipes to common knot joints each having at least two outlet ports which are connected to each auxiliary pipe.

Use of such common knot joints makes it possible that one water supply line branched from each auxiliary pipe is connected to at least two sprinkler heads. Therefore, it is not necessary to equip each auxiliary pipe with branch pipes in corresponding relation to individual sprinkler heads as conventionally required; and in addition the number of auxiliary pipes can be reduced. Thus, the piping arrangement as a whole can be simplified and individual pipes required can also be simplified. As a result, a series of pipe installing works involved can be much simplified and very efficiently executed.

Furthermore, the use of flexible joint pipes for connection between the common knot joints and the sprinkler heads affords easy placement of each individual sprinkler head in a desired position and ease of sprinkler handling, thus facilitating the execution of the required pipework.

The resulting piping arrangement, which carries a plurality of sprinkler heads, provides good practical convenience and involves a reduced number of parts as compared with the prior art piping arrangement, thus contributing much toward simplified pipe installing operation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. 1 through 5 illustrate one embodiment of the invention: FIG. 1(a) is a schematic plan view showing a pipe arrangement representing the embodiment; FIG. 1(b) is a schematic perspective view thereof; FIG. 2 is a fragmentary enlarged perspective view thereof; FIG. 3 is a plan view showing a five-port connection joint; FIG. 4 is a fragmentary sectional view showing a connection between a flexible joint pipe and a joint pipe; and FIG. 5 is a plan view showing flexible joint pipes arranged in position;

FIG. 6 is a front view showing another embodiment with respect to the piping configuration of from five-port connection joint and up to elbow;

FIGS. 7 and 8 illustrate a prior art arrangement: FIG. 7(a) is a schematic plan view thereof; FIG. 7(b) is a schematic perspective view thereof; and FIG. 8 is a fragmentary enlarged perspective view thereof.

- 1 main water-supply pipe;
- 5 auxiliary water-supply pipe;
- 10 knot joint;
- 12 flexible joint pipe;
- 13 joint pipe;
- 15 sprinkler head;
- 19 movable member;
- 20 externally threaded portion;
- 21 annular collar;
- 22 clamping element;

23 seal member.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

One example of a piping arrangement for supplying water to sprinkler heads and a method therefore according to the invention will now be described with reference to the accompanying drawings.

As FIGS. 1 and 2 show, nipples 3 are first connected individually to tees 2 which are connected at specified intervals to a fire-water main supply pipe 1 installed in the ceiling of a house, and to each of the nipples 3 is in turn connected an auxiliary water-supply pipe 5 through a tee 4. A plurality of auxiliary water-supply pipes 5 are arranged in parallel to one another and in intersecting relation to the main supply pipe 1 as shown in FIG. 1.

Then, tees 6 are incorporated into each auxiliary supply pipe 5 at specified intervals, and to each tee 6 is connected an inlet port 8 of a so-called five-port connection joint 10 through a nipple 7. Such a joint 10, as FIG. 3 shows, comprises the inlet port 8, which is formed generally centrally of the joint, and four outlet ports 9 ... formed in a cross pattern, each outlet port 9 being formed on its outer periphery 19 with an externally threaded portion 20.

Joint pipes 11, 13 are previously connected respectively to opposite ends of a flexible joint pipe 12 having good flexibility, and a sprinkler head 15 is connected to the one joint pipe 13 through an elbow 14. Then, the joint pipe 11 may be simply connected to one outlet port 9 of the five-port connection joint 10. This affords reduction of required work time at the site.

To connect the flexible joint pipe 12 to the joint pipes 11, 13, as FIG. 4 shows, clamping elements 22 for the flexible joint pipe 12 are brought in thread engagement with respective externally threaded portions 20 of the joint pipes 11, 13 so that annular collars 21 of the flexible joint pipe 12 are respectively pressed on the back by the clamping elements 22, whereby each of the annular collars 21 and the front end of one of the joint pipes 11, 13 are pressed against each other through an O-ring 23. In this way, the flexible joint pipe 12 can be easily connected to the joint pipes 11, 13.

According to the foregoing arrangement, each flexible joint pipe 12 can be connected to joint pipes 11 or 13 having an inner diameter ℓ_1 almost equal to the inner diameter ℓ_2 of the flexible joint pipe 12, and this provides an advantage that a desired amount of fire water can be allowed to flow in good condition through the entire piping arrangement without any drop in flow rate being caused by a friction loss due to liquid friction at any such pipe connection.

Sprinkler heads 15 are fixedly mounted in position on the ceiling or the like through the intermediary of elbows 14, etc. In this case, the fact that the flexible joint pipes 12 are quite flexible and light is particularly advantageous in that they are very easy to handle; they can

simply be trained over the ceiling without use of any hanger means.

Necessary piping work for sprinkler head mounting is completed through the foregoing procedure and, as a result, a pipe arrangement is obtained such that four water-supply outlets are branched from one water-supply outlet in each auxiliary pipe 5, with four sprinkler heads 15 individually mounted to the branched water-supply outlets.

In this case, if any flexible joint pipe 12 is likely to contact metallic members 24 or the like disposed on other pipes or in a loft, a cylindrical movable member 19 of an insulative material, such as rubber, may be movably fitted on the flexible joint pipe 12 as shown in FIG. 5, so that possible electrolytic corrosion due to contact of different kinds of metals can be prevented by moving the movable member 19 to such portion of contact. Thus, the piping arrangement can be maintained in good condition over a long period of time.

When fire water is supplied to the main supply pipe 1, the fire water is supplied to the sprinkler heads 15 via the auxiliary supply pipes, five-port connection joints, and flexible joint pipes 12 and are in turn released from the sprinkler heads 15.

In the present example, as described above, each auxiliary pipe 5 branches, at each specified point, in four directions through the intermediary of one five-port connection joint 10, and accordingly four sprinkler heads 15 can be mounted for each group of such four branches. This eliminates the necessity of providing branch pipes extending from each auxiliary pipe 5 in corresponding relation to the required number of sprinkler heads 15 and affords reduction in the number of auxiliary pipes 5. The necessity of providing discrete complex piping means is also eliminated.

Therefore, the required piping arrangement for sprinkler head mounting is simplified as a whole, which enables reduction in the number of parts required and affords easy and prompt execution of installing works involved. Thus, the invention provides a further advantage that piping repairs and other maintenance and inspection operations can be carried out at ease.

In the foregoing example, five-port connection joints 10 are employed to branch water supply in four directions, but it is to be understood that the configuration of such joint according to the invention is not limited to the one shown and may be suitably changed or varied according to the location, object, etc. for which such joint is to be used. It is only required that such joint should have at least two outlet ports.

In the foregoing example, flexible joint pipes 12 are connected to outlet ports of each joint 10 or elbows 14 through joint pipes 11, 13; but it is understood that the piping arrangement for water supply from auxiliary supply pipes 5 to sprinkler heads 15 is not particularly limited. For example, flexible joint pipes 12 may be connected directly to outlet ports of each joint 10 or elbows 10, and not through joint pipes 11, 13, as shown in FIG. 6. It is only required that sprinkler heads 15 are

connected to auxiliary supply pipes 5 through flexible joint pipes 12.

Claims

1. A piping arrangement for supplying water to sprinkler heads comprising:
a main supply pipe (1), installed in the ceiling of a house;
auxiliary water-supply pipes (5) connected to said main supply pipe (1) in spaced relationship, respectively; and
sprinkler heads (15) connected to each of said auxiliary water supply pipes (5) in spaced relationship to each other,
characterized by
sprinkler head arrangements, wherein each of said sprinkler head arrangements comprises at least two sprinkler heads (15), which are correspondingly connected through flexible joint pipes (12) to outlet ports (9) of a common knot joint (10), said knot joint (10) having an inlet port (8) connected to said auxiliary supply pipe (5).
2. The piping arrangement as set forth in claim 1, wherein the sprinkler heads (15) are connected to respective outlet ports (9) of each said joint (10) through a joint pipe (11, 13) and one of the flexible joint pipes (12).
3. The piping arrangement as set forth in claim 1, wherein each of said joints (10) has four outlet ports (9).
4. The piping arrangement as set forth in claim 1, further comprising annular collars (21) formed on the outer periphery of each said flexible joint pipe (12) at opposite ends thereof, an externally threaded portion (20) formed on the outer periphery of each outlet port (9) of each said joint (10) to which said flexible joint pipe (12) is connected, and a clamping element (22) threadedly engageable with said externally threaded portion (20), whereby as said annular collar (21) is pressed on the back by said clamping element (22), the front of said annular collar (21) is brought in abutment against the front end of the joint (10) through a seal member (23).
5. The piping arrangement as set forth in claim 2, further comprising annular collars (21) formed on the outer periphery of each said flexible joint pipe (12) at opposite ends thereof, an externally threaded portion (20) formed on the outer periphery of each said joint pipe (11, 13) to which said flexible joint pipe (12) is connected, and a clamping element (22) threadedly engageable with said externally threaded portion (20), whereby as said annular collar (21) is pressed on the back by said clamping element (22), the front of said annular collar (21) is brought in abut-

ment against the front end of the joint through a seal member (23).

6. The piping arrangement as set forth in claim 1, wherein at least one movable member (19) made of an insulative material is movably fitted on each said flexible joint pipe (12)
7. A method of installing pipes for a piping arrangement according to claim 1, comprising the following steps:
providing a main supply pipe at the ceiling of a house; connecting to said main supply pipe auxiliary water-supply pipes in spaced relationships, respectively; and
mounting at least two sprinkler heads in spaced relationship to each other through a common knot joint to each of said auxiliary water-supply pipes.

Patentansprüche

1. Leitungsanordnung für die Versorgung von Sprinklerköpfen mit Wasser, mit:
einer in der Decke eines Hauses angeordneten Hauptversorgungsleitung (1); jeweils mit der Hauptversorgungsleitung (1) in einem beabstandeten Verhältnis verbundenen Nebenwasserversorgungsleitungen (5); und Sprinklerköpfen (15), die mit jeder der Nebenwasserversorgungsleitungen (5) in beabstandetem Verhältnis zueinander verbunden sind, **gekennzeichnet durch** Sprinklerkopfanordnungen, wobei jede der Sprinklerkopfanordnungen wenigstens zwei Sprinklerköpfe (15) aufweist, die entsprechend durch flexible Verbindungsleitungen (12) mit Auslaßöffnungen (9) einer gemeinsamen Knotenverbindung (10) verbunden sind, wobei die Knotenverbindung (10) eine mit der Nebenversorgungsleitung (5) verbundene Einlaßöffnung (8) besitzt.
2. Leitungsanordnung nach Anspruch 1, wobei die Sprinklerköpfe (15) mit jeweiligen Auslaßöffnungen (9) jeder Verbindung (10) durch eine Verbindungsleitung (11, 13) und einer der flexiblen Verbindungsleitungen (12) verbunden sind.
3. Leitungsanordnung nach Anspruch 1, wobei jede der Verbindungen (10) vier Auslaßöffnungen (9) besitzt.
4. Leitungsanordnung nach Anspruch 1, weiterhin mit ringförmigen Bündeln (21), die am Außenumfang jeder flexiblen Verbindungsleitung (12) an gegenüberliegenden Enden ausgebildet sind, einem mit einem Außengewinde versehenen Abschnitt (20), der an dem Außenumfang jeder Auslaßöffnung (9) jeder Verbindung (10), mit der die flexible Verbindungsleitung (12) verbunden ist, ausgebildet ist, und einem Klemmelement (22), welches mit dem Außengewindeabschnitt (20) in Gewinde-



connected to auxiliary supply pipes 5 through flexible joint pipes 12.

Claims

1. A piping arrangement for supplying water to sprinkler heads comprising:
a main supply pipe (1), installed in the ceiling of a house;
auxiliary water-supply pipes (5) connected to said main supply pipe (1) in spaced relationship, respectively; and
sprinkler heads (15) connected to each of said auxiliary water supply pipes (5) in spaced relationship to each other,
characterized by
sprinkler head arrangements, wherein each of said sprinkler head arrangements comprises at least two sprinkler heads (15), which are correspondingly connected through flexible joint pipes (12) to outlet ports (9) of a common knot joint (10), said knot joint (10) having an inlet port (8) connected to said auxiliary supply pipe (5).
2. The piping arrangement as set forth in claim 1, wherein the sprinkler heads (15) are connected to respective outlet ports (9) of each said joint (10) through a joint pipe (11, 13) and one of the flexible joint pipes (12).
3. The piping arrangement as set forth in claim 1, wherein each of said joints (10) has four outlet ports (9).
4. The piping arrangement as set forth in claim 1, further comprising annular collars (21) formed on the outer periphery of each said flexible joint pipe (12) at opposite ends thereof, an externally threaded portion (20) formed on the outer periphery of each outlet port (9) of each said joint (10) to which said flexible joint pipe (12) is connected, and a clamping element (22) threadedly engageable with said externally threaded portion (20), whereby as said annular collar (21) is pressed on the back by said clamping element (22), the front of said annular collar (21) is brought in abutment against the front end of the joint (10) through a seal member (23).
5. The piping arrangement as set forth in claim 2, further comprising annular collars (21) formed on the outer periphery of each said flexible joint pipe (12) at opposite ends thereof, an externally threaded portion (20) formed on the outer periphery of each said joint pipe (11, 13) to which said flexible joint pipe (12) is connected, and a clamping element (22) threadedly engageable with said externally threaded portion (20), whereby as said annular collar (21) is pressed on the back by said clamping element (22), the front of said annular collar (21) is brought in abut-

ment against the front end of the joint through a seal member (23).

6. The piping arrangement as set forth in claim 1, wherein at least one movable member (19) made of an insulative material is movably fitted on each said flexible joint pipe (12)
7. A method of installing pipes for a piping arrangement according to claim 1, comprising the following steps: providing a main supply pipe at the ceiling of a house; connecting to said main supply pipe auxiliary water-supply pipes in spaced relationships, respectively; and mounting at least two sprinkler heads in spaced relationship to each other through a common knot joint to each of said auxiliary water-supply pipes.

Patentansprüche

1. Leitungsanordnung für die Versorgung von Sprinklerköpfen mit Wasser, mit:
einer in der Decke eines Hauses angeordneten Hauptversorgungsleitung (1); jeweils mit der Hauptversorgungsleitung (1) in einem beabstandeten Verhältnis verbundenen Nebenwasserversorgungsleitungen (5); und Sprinklerköpfen (15), die mit jeder der Nebenwasserversorgungsleitungen (5) in beabstandetem Verhältnis zueinander verbunden sind, gekennzeichnet durch Sprinklerkopfanordnungen, wobei jede der Sprinklerkopfanordnungen wenigstens zwei Sprinklerköpfe (15) aufweist, die entsprechend durch flexible Verbindungsleitungen (12) mit Auslaßöffnungen (9) einer gemeinsamen Knotenverbindung (10) verbunden sind, wobei die Knotenverbindung (10) eine mit der Nebenversorgungsleitung (5) verbundene Einlaßöffnung (8) besitzt.
2. Leitungsanordnung nach Anspruch 1, wobei die Sprinklerköpfe (15) mit jeweiligen Auslaßöffnungen (9) jeder Verbindung (10) durch eine Verbindungsleitung (11, 13) und einer der flexiblen Verbindungsleitungen (12) verbunden sind.
3. Leitungsanordnung nach Anspruch 1, wobei jede der Verbindungen (10) vier Auslaßöffnungen (9) besitzt.
4. Leitungsanordnung nach Anspruch 1, weiterhin mit ringförmigen Bündeln (21), die am Außenumfang jeder flexiblen Verbindungsleitung (12) an gegenüberliegenden Enden ausgebildet sind, einem mit einem Außengewinde versehenen Abschnitt (20), der an dem Außenumfang jeder Auslaßöffnung (9) jeder Verbindung (10), mit der die flexible Verbindungsleitung (12) verbunden ist, ausgebildet ist, und einem Klemmelement (22), welches mit dem Außengewindeabschnitt (20) in Gewindee-



ingriff bringbar ist, wodurch, wenn der ringförmige Bund (21) an der Rückseite durch das Klemmelement (22) mit Druck beaufschlagt ist, die Vorderseite des ringförmigen Bundes (21) durch ein Dichtungsglied (23) gegen das vordere Ende der Verbindung (10) in Anlage gebracht ist.

5. Leitungsanordnung nach Anspruch 1, weiterhin mit ringförmigen Bündeln (21), die am Außenumfang jeder flexiblen Verbindungsleitung (12) an gegenüberliegenden Enden ausgebildet sind, einem mit einem Außengewinde versehenen Abschnitt (20), der an dem Außenumfang jeder Verbindungsleitung (10), mit der die flexible Verbindungsleitung (12) verbunden ist, ausgebildet ist, und einem Klemmelement (22), welches mit dem Außengewindeabschnitt (20) in Gewindeeingriff bringbar ist, wodurch, wenn der ringförmige Bund (21) an der Rückseite durch das Klemmelement (22) mit Druck beaufschlagt ist, die Vorderseite des ringförmigen Bundes (21) durch ein Dichtungsglied (23) gegen das vordere Ende der Verbindung (10) in Anlage gebracht ist.
6. Leitungsanordnung nach Anspruch 1, wobei wenigstens ein aus einem Isolierwerkstoff gefertigtes bewegbares Glied (19) an jeder flexiblen Verbindungsleitung (12) bewegbar angeordnet ist.
7. Verfahren zum Einbau von Leitungen für eine Leitungsanordnung nach Anspruch 1, mit den folgenden Schritten:
Vorsehen einer Hauptversorgungsleitung an dem Dach eines Hauses;
Verbinden von jeweiligen Nebenwasserversorgungsleitungen mit der Hauptversorgungsleitung in beabstandeten Verhältnissen; und
Anordnen von wenigstens zwei Sprinklerköpfen beabstandet zueinander durch eine gemeinsame Knotenverbindung an jeder der Nebenwasserversorgungsleitungen.

Revendications

1. Dispositif de tuyaux pour l'amenée d'eau à des buses de pulvérisation, comprenant :
un tuyau principal d'alimentation (1), installé dans le plafond d'un bâtiment ;
des tuyaux auxiliaires de distribution d'eau (5) connectés audit tuyau principal d'alimentation (1) en relation espacée, respectivement ; et
des buses de pulvérisation (15) connectées à chacun desdits tuyaux auxiliaires de distribution d'eau (5), à distance les unes des autres ;
caractérisé par des agencements des buses de pulvérisation, de sorte que chacun desdits agencements de buses de pulvérisation comprend au moins deux buses de pulvérisation (15) qui sont connectées de façon correspondante par des tuyaux de

liaison souples (12) à des tubulures de sortie (9) d'un raccord central commun (10), ledit raccord commun (10) ayant une tubulure d'entrée (8) connectée audit tuyau auxiliaire de distribution (5).

2. Dispositif de tuyaux suivant la revendication 1, dans lequel les buses de pulvérisation (15) sont connectées à des tubulures de sortie respectives (9) de chaque dit raccord (10) au moyen d'un tube de jonction (11,13) et d'un des tuyaux de liaison souples (12).
3. Dispositif de tuyaux suivant la revendication 1, dans lequel chacun desdits raccords (10) comporte quatre tubulures de sortie (9).
4. Dispositif de tuyaux suivant la revendication 1, comprenant en outre des collerettes annulaires (21) formées sur la périphérie extérieure de chaque tuyau de liaison souple (12) aux extrémités opposées de celui-ci, un filetage extérieur (20) formé sur la périphérie extérieure de chaque tubulure de sortie (9) de chaque dit raccord (10) auquel ledit tuyau de liaison souple (12) est connecté, et un élément de serrage (22) qui peut se visser sur ledit filetage extérieur (20) de sorte que, lorsque ladite collerette annulaire (21) est pressée sur l'arrière par ledit élément de serrage (22), la face avant de ladite collerette annulaire (21) vient en butée contre l'extrémité avant du raccord (10) par l'intermédiaire d'un élément d'étanchéité (23).
5. Dispositif de tuyaux suivant la revendication 2, comprenant en outre des collerettes annulaires (21) formées sur la périphérie extérieure de chaque dit tuyau de liaison souple (12) aux extrémités opposées de celui-ci, un filetage extérieur (20) formé sur la périphérie extérieure de chaque dit tube de jonction (11,13) auquel ledit tuyau de liaison souple (12) est connecté, et un élément de serrage (22) qui peut se visser sur le dit filetage extérieur (20) de sorte que, quand la collerette (21) est pressée à l'arrière par ledit élément de serrage (22), l'avant de ladite collerette annulaire (21) vient en butée contre l'extrémité avant du raccord par l'intermédiaire d'un élément d'étanchéité (23).
6. Dispositif de tuyaux suivant la revendication 1, dans lequel au moins un élément mobile (19) en matière isolante est monté de façon déplaçable sur chaque dit tuyau de liaison souple (12).
7. Procédé d'installation de tuyaux pour un dispositif de tuyaux suivant la revendication 1, comprenant les étapes suivantes :
installation d'un tuyau principal d'alimentation dans le plafond d'un bâtiment ;
connexion, audit tuyau principal d'alimentation, de tuyaux auxiliaires de distribution d'eau en



relation espacée, respectivement ; et
montage au moins de deux buses de pulvé-
risation mutuellement espacées, sur chacun desdits
tuyaux auxiliaires de distribution d'eau, par l'inter-
médiaire d'un raccord central commun.

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