Title of the Invention: Safety guardrails and outdoor escape stairs, which are integrated and foldable
Abstract Title: Safety guardrails and outdoor escape stairs, which are integrated and foldable

The present invention relates to safety guardrails, outdoor escape stairs, and an evacuation device, which are integrated and foldable and are for a high-rise building, the guardrails, the stairs, and the device being applicable to a high-rise building and being the same as safety guardrails and the like provided in order to prevent a fall from apartment housing such as an apartment, from an office building, or from a movable passage exposed to the outside. The present invention is usually used as safety guardrails for preventing a fall and applied in place of safety guardrails of 3 m or higher above ground level in a high-rise building or outdoors such that an evacuee in a high-rise part can escape to the outside or can safely evacuate downstairs when an emergency such as a fire breaks out. Particularly, the present invention relates to safety guardrails, outdoor escape stairs, and an evacuation device, which are integrated and foldable and are for a high-rise building, the guardrails, the stairs, and the device mainly comprising: a fence unit (1) in which an entry/exit unit (10) and a safety fence unit (20) are integrally formed; and a sliding stairs unit (30) formed at the lower part of the fence unit (1).
INTEGRATED FOLDING SAFETY HANDRAIL AND OUTDOOR ESCAPE STAIRS

The present invention relates to an emergency escape device combined with a folding safe handrail which is applied to high-rise buildings of 3 m or more from the ground, such as safety handrails for falling prevention at apartment houses such as high-rise building apartments or office buildings, and is applied to a high-rise handrail or high-rise safety handrail of a building which is usually used as a safety handrail for falling prevention and so that an escaping person in the high-rise building escapes outside or safely escapes to a lower floor in case of emergency such as fire, terror, and disaster.

Particularly, the present invention relates to an integrated folding safety handrail and outdoor escape stairs for high-rise buildings and an emergency escape device, including a fence unit in which an entrance unit 10 and a safety fence unit 20 are integrated; and a sliding stair unit 30 formed at a lower end of the fence unit 1.

As the society develops, the centralization of the city is becoming more and more intensive, and office buildings and apartment buildings in the city are becoming higher. However, such high-rise buildings are increasingly exposed to fire and external hazards, and disasters are becoming larger.

The reason is that due to the increase in installation of electronic equipment and electric heating appliances, cooling and heating equipment and other electronic appliances in many places of modern high-rise buildings, the probability of fire
increases day by day due to heating of the electric heating appliances, electrical overload, short-circuit, lighting, natural disaster, and the like.

However, when an emergency situation such as a fire occurs in such a high-rise or super-rise building and the emergency staircase is closed, people inside the building need to passively wait for a skyscraper ladder which is an escape device without active escaping equipment and devices, and the skyscraper ladder can not approach a certain floor or more or is very limited to access the floor within a short time. Also, in the event of a disaster in outdoor and indoor shopping malls or concert halls, a stadium, and the like, where people concentrate, the danger is multiplied by the bottleneck of the evacuation passage when many people are concentrated to the emergency stairs at the same time.

For this reason, it is very limited or almost impossible to escape to the outside from the inside of a building when an emergency occurs in a skyscraper or a concert hall, and when an emergency such as a fire occurs inside the skyscraper all over the world, many people will be injured repeatedly.

In order to solve such a problem, escaping methods for apartment houses have been proposed variously in the Building Law to escape when emergency situations such as fire occur. A representative example is that a fire shelter needs to be installed indoors to be blocked from the outside when a fire occurs.

However, these indoor fire escape facilities are not intended to escape when a fire occurs, but only to passively escape temporarily from the fire scene until the fire suppression and saving are achieved.

In order to solve this problem, a sprinkler is mandatorily installed in high-rise buildings, fire extinguishers are mandatorily installed or emergency stairs are installed, and thus fire escape facilities are constructed on each floor. In addition,
there is disclosed a technique in which a fire escape facility constructed for each floor is provided with a device capable of continuously escaping toward the lower floor, but the device is provided in a building and the rapid escape is very limited.

In addition, the proposed escape devices can escape downward from the upper floor to the lower floor, but even if there is no urgent situation in the upper floor, there is a risk of easily entering the lower floor. There is a disadvantage in that it is difficult for a liver to install a locking device in the entrance of the escape passage for preventing invasion of privacy to use the escape device in an emergency situation.

In addition, in the case of such an indoor fire escape facility, it is necessary to design a separate space when designing the apartment house. As a result, it is inconvenient that the living space of the resident is reduced after completion, and there are many cases where the escape space and the escape facility are not equipped in the already completed building.

In order to overcome the above-mentioned problem of the escape facility, there has been proposed an escape facility or escape device installed outside the building. However, mostly, it is difficult to verify their effectiveness, and due to its structural characteristic, a lot of volume is occupied and mostly, it is reluctant to install and use the escape device.

A representative example of such an outdoor type escape device is proposed in Korean Patent Registration No. 10-1562205 (Safety fire escape system in high-rise building, registered on Oct. 15, 2015). However, in the case of the above-described technique, the mechanical impact is applied to the outer wall of the lower floor due to the centrifugal force during the operation for escaping in case of
emergency, and there is a problem in that the escaping person of the lower floor may be hit.

In addition, there is a risk that the escaping person will fall to the opened outside of the escape device because the safety compartments such as fences of a plurality of escape devices are not properly installed in case of emergency, and there is a problem that the escaping person is reluctant to escape downward in the case of acrophobia and the like.

【Disclosure】

【Technical Problem】

In order to solve the above problems, an object of the present invention is to provide an integrated folding safety handrail and outdoor escape stairs and an escape device so that an escaping person may safely escape so as not to be exposed to the outside of the escape device when the escape device is unfolded and operates for escaping in case of emergency.

Another object of the present invention is to provide integrated folding safety handrail and outdoor escape stairs and an emergency escape device capable of minimizing a mechanical impact applied to an escape device when unfolding for escaping and normally serving as a safety rail for falling prevention. In addition, safety handrails such as concert halls and stadiums where people gather together or some safety handrails in the moving route can be replaced with the present invention, thereby providing a variety of escape routes to a large number of people in the event of an emergency disaster. In addition, the present invention is configured to be continuously unfolded from a high-rise position to a ground floor or a position to escape of the escaping person without using external power.
Yet another object of the present invention is to provide an integrated folding safety handrail and outdoor escape stairs and an emergency escape device, including a fence unit in which an entry unit 10 and a safety fence unit 20 are integrated; and a sliding stair unit 30 formed at a lower end of the fence unit 1, thereby facilitating site assembly during installation and corresponding to directionality according to a site situation by combining respectively component parts.

[Technical Solution]

An exemplary embodiment of the present invention provides a fence unit 1 in which an entrance unit 10 and a safety fence unit 20 are integrated; and a sliding stair unit 30 provided inside the safety fence unit 20 and installed so that escape stairs are unfolded to escape downward and slide, in which the entrance unit 10 is installed on the outside of the high-rise building or a high-rise outdoor safety fence and unfolded and protrudes to form an escape space on the outer wall of the building in order to escape to the outside of the building from the inside which is an escape place in case of emergency, in an emergency escape device which is normally used as a handrail for falling prevention and used for evacuation and escape in case of emergency, and the safety fence unit 20 is extended from the entrance unit 10 and unfolded to form a space to escape downward.

The entrance unit 10 may include a coupling frame 12 attached on the outer well of the building, a fence plate 13 corresponding to the coupling frame 12, and a folded fence 14 coupled to the fence plate 13 and one side of the coupling frame 12 to be folded and further include an unfolding footplate 15 coupled to the inner lower end, and the folding fence 14 may have a hinge at the center and be formed so that a pair of rectangular frames are coupled to each other based on the hinge and a
folding downward stair 11 may be coupled to each rectangular frame, so that an escaping person may move downward when the escaping person escapes downward from the upper floor to the lower floor of the multi-family houses.

The safety fence unit 20 may include a fastening plate 21 coupled to the outer wall side of the building, a safety fence 22 corresponding to the fastening plate 21 and provided to be unfolded and spaced apart from the outer wall of the building, a support portion 23 provided on a side opening portion of the safety fence 22 and the fastening plate 21, a guide rod 24 provided so that the support portion 23 may move when the safety fence 22 is unfolded, a hinge bar 25 provided at the upper side of the safety fence 22 and the fastening plate 21, and locking protrusions 26 extended in the longitudinal direction of the safety fence unit 20 to be formed at predetermined intervals, and the sliding stair unit 30 may be configured by coupling a pair of sliding fences 31 and a folding stair 32 provided inside the sliding fence 31, and a folding fence 34 provided on an opened surface of the pair of sliding fences 31 and a locking portion 31a provided on one side of the sliding fences 31.

The folding fence 34 may be formed to be coupled to a pair of rectangular frames based on the hinge to be folded based on the hinge, and a plurality of horizontal bars 34a may be formed in a ladder shape in the pair of rectangular frames, and the horizontal bar 34a may prevent the escaping person from falling on the opened surface of the pair of sliding fences 31 and be held and move downward, when the escaping person escapes downward. In addition, the support portion 23 to easily unfold and support the safety fence 22 in the case of emergency such as firing may include a support bar 23a configured in a scissor form in which a pair of bars are hinge-coupled, a coupling hinge 23b which is coupled to the fastening frame 21 and a part of the upper portion of the safety fence 22,
respectively, so that one end of the support bar 23a is rotatable, and a transfer hinge 23c by which the other end of the support bar 23a is extrapolated into the guide rod 24 provided at the fastening frame 21 and one side of the safety fence 22 to be hinge-coupled to be movable.

The transfer hinge 23c may move along the guide rod 24 to be supported when the scissor-shaped support bar 23a is unfolded, and an elastic member 24b is further included at one side of the guide rod 24, and when folding, the transfer hinge 23c may press the elastic member 24b, and when unfolding, the transfer hinge 23c may be transferred upward by the pressed elastic force to be easily unfolded.

A control unit 40 for unfolding the emergency escape device may be provided at one side of the entrance unit 10, a push unit 50 may be configured at one end of the entrance unit 10 and a punch unit 60 may be configured at one end of the safety fence unit 20, and the control unit 40 and the locking device 26 may be connected to each other by a wire w, and the wire w may be pulled by pulling the control unit 40 to pull the locking protrusions and then while the locking protrusions and the sliding fence 31 are separated from each other, the sliding stair unit 30 may descend.

When the fence units 1 and the slide stair units 30 are installed on a plurality of floors, the locations of the entrance units 10 may be alternately arranged for each floor, and when the slide stair unit 30 descends, the punch unit 60 configured in the slide stair unit 30 may hit the push unit 50 configured in the entrance unit 10 to unfold the fence unit 1 and the slide stair unit 30 at the lower floor and then the fence units 1 and the slide stair units 30 at the plurality of floors may be continuously unfolded.

【Advantageous Effects】
According to the present invention, an emergency escape device combined with an integrated folding safety handrail for high-rise buildings is provided, and when the escape device is unfolded in case of emergency, an escaping person safely escapes without being exposed to the outside of the emergency device and it is effective to minimize the fear of the escaping person with phobias and minimize the damage of humans by rapid evacuation.

Further, (a) when the escape device is unfolded, a mechanical impact applied to the device is reduced to enhance the lifespan and safety, (b) a fence unit 1 in which an entrance unit 10 and a safety fence unit 20 are integrated and a sliding stair unit 30 configured at a lower end of the fence unit 1 are included, and thus, it is possible to easily assemble respective parts at the time of installation so that cost and time required for installation and assembly can be reduced according to the situation of the site.

In addition, when the escaping person wants to escape to the ground floor, the integrated folding safety handrail and outdoor escape stairs can be configured to be continuously automatically unfolded from the location of the escaping person to the ground. Alternatively, a person applying the present invention to the buildings autonomously selects the location which is automatically and continuously unfolded in order to actively escape in the case of firing and emergency, thereby promoting efficiency of the escape.

【Description of Drawings】

FIG. 1 is a perspective view of the present invention.

FIG. 2 is a perspective view of the present invention which is folded.

FIG. 3 is an exemplary view of an operating state of the present invention.
FIG. 4 is a partially enlarged view for illustrating a locking device 26 according to the present invention.

FIG. 5 is a partially enlarged view for illustrating an unfolding operation according to the present invention.

FIG. 6 is an exemplary view illustrating an operation of a folded stair 32 according to the present invention.

FIG. 7 is an exemplary view for illustrating an example in which the present invention is installed and unfolded in a continuous operation.

FIGS. 8 and 9 are exemplary views illustrating another operating state according to the present invention.

[Modes of the Invention]

The present invention will be described in detail with reference to the accompanying drawings.

FIG. 1 is a perspective view of the present invention, FIG. 2 is a perspective view of the present invention which is folded, and FIG. 3 is an exemplary view of an operating state of the present invention.

FIG. 4 is a partially enlarged view for illustrating a locking device 26 according to the present invention, FIG. 5 is a partially enlarged view for illustrating an unfolding operation according to the present invention, and FIG. 6 is an exemplary view illustrating an operation of a folded stair 32 according to the present invention.

When describing the present invention in detail with reference to FIGS. 1 to 6, an integrated folding safety handrail and outdoor escape stairs and an emergency escape device of the present invention are attached to an outer wall of an apartment house and are normally installed in a folded state with a fall-prevention rail on a
balcony or the like and then unfolded in case of emergency and used as the
emergency escape device.

The integrated folding safety handrail and outdoor escape stairs for high-rise
buildings and the emergency escape device includes a fence unit 1 in which an
entrance unit 10 protruding from an outer wall of the building to form an escape
space to escape to an outside or a lower floor of the building in a moving path of an
inside or a high floor which is an escape place in case of emergency such as firing is
integrated with a safety fence unit 20 adjacent to the entrance unit 10 and forming a
space for escaping downward; and a sliding stair unit 30 provided inside the safety
fence unit 20 and installed so that escape stairs are unfolded to escape downward
and slide.

The entrance unit 10 includes a coupling frame 12 attached on the outer wall
of the building, a fence plate 13 corresponding to the coupling frame 12, and a
folding fence 14 coupled to the fence plate 13 and one side of the coupling frame 12
to be folded and further includes an unfolding footplate 15 coupled to the inner lower
end.

In this case, the unfolding footplate 15 is formed to be folded at a center by a
hinge and both ends are hinge-coupled to the coupling frame 12 and the lower end
of the fence plate 13, respectively.

The entrance unit 10 configured above is formed as a structure having a
space at the inside by coupling the coupling frame 12 and the side of the fence plate
13 with the folding fence 14 and coupling the coupling frame 12 and the lower end of
the fence plate 13 by the unfolding footplate 15.

Herein, the folding fence 14 has a hinge at the center and is formed so that a
pair of rectangular frames are coupled to each other based on the hinge and a
folding downward stair 11 is coupled to each rectangular frame, so that an escaping person may move downward when the escaping person at a high-riser building or a high floor escapes downward from the upper floor to the lower floor.

As a result, small children as well as adults may easily escape downward.

5 In more detail, the folding fence 14 is located to correspond to the end of the emergency escape device installed at each of many floors and used when the escaping person moves downward to move from the upper floor to an emergency escape device installed at the next floor.

The safety fence unit 20 extended at the side of the entrance unit 10 includes

10 a fastening plate 21 coupled to the outer wall side of the building, a safety fence 22 corresponding to the fastening plate 21 and provided to be unfolded and spaced apart from the outer wall of the building, a support portion 23 provided on a side opening portion of the safety fence 22 and the fastening plate 21, a guide rod 24 provided so that the support portion 23 may move when the safety fence 22 is unfolded, and a hinge bar 25 provided at the upper side of the safety fence 22 and the fastening plate 21.

Further, a plurality of vertical bars 22a is further provided at one side of the safety fence 22 to prevent the escaping person from falling.

Further, a plurality of sliding stair units 30 having different entire lengths is provided inside the safety fence unit 20, and the sliding stair units 30 are located inside the safety fence unit 20 and then unfolded with the safety fence unit 20 when unfolded for escaping in case of emergency and down from the safety fence unit 20 to serve as emergency stairs.
In this case, the sliding stair unit 30 includes a pair of sliding fences 31 and a folding stair 32 provided inside the sliding fence 31, and a folding fence 34 which is coupled with an opened surface of the sliding fence 31.

In this case, the folding fence 34 is formed to be coupled to a pair of rectangular frames based on the hinge to be folded based on the hinge, and a plurality of horizontal bars 34a is formed in a ladder shape in the pair of rectangular frames.

The horizontal bar 34a is provided to allow the escaping person to hold while escaping downward and move downward and prevents the escaping person from falling on the opened surface of the pair of sliding fences 31.

The sliding fence 31 may be formed in a stepped shape with a plurality of vertical bars having different entire lengths in a stepwise manner.

In addition, the sliding fence 31, which is spaced apart from the outer wall of the building and unfolded, may further include a safety bar for preventing the escaping person from falling.

More specifically, the length of the vertical bar is increased as the distance from the entrance unit 10 increases, so that the height of the vertical bar is lowered stair by stair.

Accordingly, vertical bars having different heights are arranged in sequence to maintain a downward shape.

A deceleration coupling hole 33 is further provided at one side of the sliding fence 31. The deceleration coupling hole 33 is extrapolated into a plurality of vertical bars 22a provided in a longitudinal direction of the safety fence 22 to ascend in the longitudinal direction of the vertical bars 22a and supported by the horizontal
bar coupled to the lower end of the vertical bar 23a to be prevented from moving downward by a predetermined distance or more.

Such a sliding fence 31 has a plurality of stairs which are formed integrally and descend to operate simultaneously.

Herein, as such, the deceleration coupling hole 33 is provided to attenuate descending impact applied to the safety fence unit 20 when the sliding stair unit 30 descends.

In this case, a locking device 26 is configured at one side of the safety fence unit 20 and will be described with reference to FIGS. 4.

The locking device 26 is extended in the longitudinal direction of the safety fence unit 20 and has locking protrusions (not illustrated) at predetermined intervals, and in this case, the locking protrusions are fitted to a locking portion 31a formed at one side of the sliding fence 31 and then separated from the locking portion 31a to unfold the fence unit 1.

In detail, the present invention will be described with reference to FIGS. 8 and 9.

FIGS. 8 and 9 are exemplary views illustrating another operating state according to the present invention.

Accordingly, a push unit 50 is configured to move up and down at one side of the entrance unit 10 and a punch unit 60 is configured at one side of the sliding stair unit 30.

Further, referring to FIGS. 8 and 9, a control unit 40 is formed at one side of the entrance unit 10, and the control unit 40 has a grip (not illustrated) formed at one end thereof and a ring (not illustrated) formed at the other end thereof and connects the ring and the aforementioned locking protrusion through a wire w.
Meanwhile, the wire w connects the locking protrusion and the push unit 50 and may be further included separately from the wire w connecting the ring and the locking protrusion.

Accordingly, the wire w is pulled by pulling the control unit 40 to pull the locking protrusions provided in the locking device 26, and as a result, the locking protrusions and the sliding fence 31 are separated from each other and finally, the sliding stair unit 30 descends.

At this time, in addition to the operation of pulling the control unit 40, the push unit 50 may be pressed to pull the wire w connected to the push unit 50 and pull the locking unit 26.

Due to the two wires w, the locking device 26 may operated by operating both the push unit 50 and the control unit 40, and in this case, the escape device according to the present invention may also be prevented from operating by the operation of the push unit 50 of infants or children.

Meanwhile, although described below through FIG. 7, the escape devices according to the present invention are continuously installed on a plurality of floors, and as a result, while the punch unit 60 at the upper side descends by the descending of the sliding stair unit 30, the escape devices continued on the plurality of floors may also be sequentially unfolded by hitting the push unit 50 at the lower side.

Further, the support portion 23 to easily unfold and support the safety fence 22 in the case of emergency such as firing includes a support bar 23a configured in a scissor form in which a pair of bars are hinge-coupled, a coupling hinge 23b which is coupled to the fastening frame 21 and a part of the upper portion of the safety fence 22, respectively, so that one end of the support bar 23a is rotatable, and a
transfer hinge 23c by which the other end of the support bar 23a is extrapolated into
the guide rod 24 provided at the fastening frame 21 and one side of the safety fence
22 to be hinge-coupled to be movable.

When the transfer hinge 23c moves along the guide rod 24 to be supported
5 when the scissor-shaped support bar 23a is unfolded, and an elastic member 24b is
further included at one side of the guide rod 24. When folding, the transfer hinge
23c presses the elastic member 24b, and when unfolding, the transfer hinge 23c is
transferred upward by the pressed elastic force to be easily unfolded (see FIG. 5).

The sliding stair unit 30 configured above has a pair of sliding fences 31 and
10 folding stairs 32 provided inside the sliding fences 31, and the pair of the sliding
fences 31 are coupled to the safety fence 22 and the fastening fence 21,
respectively, to be unfolded together with the unfolding operation of the safety fence
unit 20.

At this time, the folding stairs 32 hinge-coupled to the lower ends of the pair
15 of sliding fences 31 is unfolded, and the folding stairs 32 are folded by hinging one
ends of a pair of the panels and serves as stairs during unfolding.

In addition, the sliding fence 31 spaced apart from the outer wall of the
building of the pair of sliding fences 31 further has vertical bars to prevent the
escaping person from falling down.

20 The plurality of integrated folding safety handrail and outdoor escape stairs of
the present invention are combined and installed on the outer wall of the high-rise
safety fence in addition to the safety fences of high-rise multi-family houses, high-
rise office buildings, and high-rise outdoor sports facilities.

To this end, an installation example according to the present invention will be
25 described below in detail below with reference to FIG. 7 which is an exemplary view.
FIG. 7 is an exemplary view for illustrating an installation example according to the present invention.

The integrated folding safety handrail and outdoor escape stairs of the present invention maintain a downward stair form of the safety fence of high-rise multi-family houses, high-rise office buildings, or high-rise outdoor sports facilities and the high-rise safety fence and serve as an emergency escape device.

More specifically, the integrated folding safety handrail and outdoor escape stairs are normally in a folded state A and applied as a fall prevention handrail and then unfolded in the case of emergency such as firing and applied as the emergency escape device.

In this case, the locations of the entrance units 10 are alternately arranged for each floor. For example, the plurality of integrated folding safety handrail and outdoor escape stairs are alternately arranged for each floor so that the entrance unit 10 is located at the left side of the outer wall of the building and the safety fence unit 20 and the sliding stair unit 30 are arranged at the side adjacent to the entrance unit 20 in a right downward stair form, and on the next floor, the entrance unit 10 is located at the right side of the outer wall of the building and the safety fence unit 20 and the sliding stair unit 30 are arranged in a left downward form.

Herein, the plurality of integrated folding safety handrail and outdoor escape stairs are alternately arranged for each floor as described above so that the stairs are arranged downward when the escaping person moves from the high floor to the lower floor in the high-rise building. In addition, the entrance unit 20, the safety fence unit 20, and the sliding stair unit 30 are separately provided and assembled before the site installation to complete the integrated folding safety handrail and
outdoor escape stairs, thereby implementing a complicated emergency escape device.

By the above implementing method, it is possible to shorten the time required for the site installation, implement the left-down type and the right-down type which are different in shape, and solve the inconvenience of separately manufacturing each part according to the type.
【CLAIMS】

[Claim 1]

An integrated folding safety handrail and outdoor escape stairs, comprising:

a fence unit 1 in which an entrance unit 10 and a safety fence unit 20 are

integrated; and

a sliding stair unit 30 provided inside the safety fence unit 20 and installed so

that escape stairs are unfolded to escape downward and slide,

wherein the entrance unit 10 is installed on the outside of the high-rise

building or a high-rise outdoor safety fence and unfolded and protrudes to form an

escape space on the outer wall of the building in order to escape to the outside of

the building from the inside which is an escape place in case of emergency, in an

emergency escape device which is normally used as a handrail for falling prevention

and used for evacuation and escape in case of emergency, and

the safety fence unit 20 is extended from the entrance unit 10 and unfolded to

form a space to escape downward.

[Claim 2]

The integrated folding safety handrail and outdoor escape stairs of claim 1, wherein the entrance unit 10 includes a coupling frame 12 attached on the outer well

of the building, a fence plate 13 corresponding to the coupling frame 12, and a

folded fence 14 coupled to the fence plate 13 and one side of the coupling frame 12
to be folded and further includes an unfolding footplate 15 coupled to the inner lower

end.

[Claim 3]

The integrated folding safety handrail and outdoor escape stairs of claim 2, wherein the folding fence 14 has a hinge at the center and is formed so that a pair of
rectangular frames are coupled to each other based on the hinge and a folding downward stair 11 is coupled to each rectangular frame, so that an escaping person may move downward when the escaping person escapes downward from the upper floor to the lower floor of high-rise multi-family houses, high-rise office buildings, or high-rise outdoor safety handrails.

[Claim 4]

The integrated folding safety handrail and outdoor escape stairs of claim 1, wherein the safety fence unit 20 includes a fastening plate 21 coupled to the outer wall side of the building, a safety fence 22 corresponding to the fastening plate 21 and provided to be unfolded and spaced apart from the outer wall of the building, a support portion 23 provided on a side opening portion of the safety fence 22 and the fastening plate 21, a guide rod 24 provided so that the support portion 23 may move when the safety fence 22 is unfolded, a hinge bar 25 provided at the upper side of the safety fence 22 and the fastening plate 21, and locking protrusions 26 extended in the longitudinal direction of the safety fence unit 20 to be formed at predetermined intervals.

[Claim 5]

The integrated folding safety handrail and outdoor escape stairs of claim 1, wherein the sliding stair unit 30 is configured by coupling a pair of sliding fences 31 and a folding stair 32 provided inside the sliding fence 31, and a folding fence 34 provided on an opened surface of the pair of sliding fences 31 and a locking portion 31a provided on one side of the sliding fences 31.

[Claim 6]

The integrated folding safety handrail and outdoor escape stairs of claim 5, wherein the folding fence 34 is formed to be coupled to a pair of rectangular frames
based on the hinge to be folded based on the hinge, and a plurality of horizontal bars 34a is formed in a ladder shape in the pair of rectangular frames, and

the horizontal bar 34a prevents the escaping person from falling on the opened surface of the pair of sliding fences 31 and is held and moves downward, when the escaping person escapes downward.

[Claim 7]

The integrated folding safety handrail and outdoor escape stairs of claim 4, wherein the support portion 23 to easily unfold and support the safety fence 22 in the case of emergency such as firing includes a support bar 23a configured in a scissor form in which a pair of bars are hinge-coupled, a coupling hinge 23b which is coupled to the fastening frame 21 and a part of the upper portion of the safety fence 22, respectively, so that one end of the support bar 23a is rotatable, and a transfer hinge 23c by which the other end of the support bar 23a is extrapolated into the guide rod 24 provided at the fastening frame 21 and one side of the safety fence 22 to be hinge-coupled to be movable.

[Claim 8]

The integrated folding safety handrail and outdoor escape stairs of claim 7, wherein the transfer hinge 23c moves along the guide rod 24 to be supported when the scissor-shaped support bar 23a is unfolded, and an elastic member 24b is further included at one side of the guide rod 24, and when folding, the transfer hinge 23c presses the elastic member 24b, and when unfolding, the transfer hinge 23c is transferred upward by the pressed elastic force to be easily unfolded.

[Claim 9]

The integrated folding safety handrail and outdoor escape stairs of claim 1, wherein a control unit 40 for unfolding the emergency escape device is provided at
one side of the entrance unit 10.

[Claim 10]
The integrated folding safety handrail and outdoor escape stairs of claim 1, wherein a push unit 50 is configured at one end of the entrance unit 10 and a punch unit 60 is configured at one end of the safety fence unit 20.

[Claim 11]
The integrated folding safety handrail and outdoor escape stairs of any one of claims 1 to 9, wherein the control unit 40 and the locking device 26 are connected to each other by a wire w, and the wire w is pulled by pulling the control unit 40 to pull the locking protrusions and then while the locking protrusions and the sliding fence 31 are separated from each other, the sliding stair unit 30 descends.

[Claim 12]
The integrated folding safety handrail and outdoor escape stairs of claim 11, wherein when the fence units 1 and the slide stair units 30 are installed on a plurality of floors, the locations of the entrance units 10 are alternately arranged for each floor, and when the slide stair unit 30 descends, the punch unit 60 configured in the slide stair unit 30 hits the push unit 50 configured in the entrance unit 10 to unfold the fence unit 1 and the slide stair unit 30 at the lower floor and then the fence units 1 and the slide stair units 30 at the plurality of floors are continuously unfolded.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

E04F 11/18(2006.01)i; E04F 11/06(2006.01)i; A62B 1/02(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

E04F 11/18; E06C 9/10; A62B 1/00; A62B 3/00; A62B 5/00; E04F 11/04; E06C 9/02; E04F 11/06; A62B 1/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility models: IPC as above

Japanese Utility models and applications for Utility models: IPC as above

Electronic database consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) & Keywords: milling, refuge, slide, stair, foothold

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>KR 10-0968162 B1 (PARK, Ki Han) 06 July 2010 See paragraphs [0008], [0011]-[0012], [0020], [0022] and figures 1-5, 7-8.</td>
<td>1-6,9-12</td>
</tr>
<tr>
<td>A</td>
<td></td>
<td>7-8</td>
</tr>
<tr>
<td>Y</td>
<td>KR 10-1562205 B1 (SMTECH et al.) 23 October 2015 See paragraphs [0023] [0027]-[0028], claim 1 and figures 1, 3-14.</td>
<td>1-6,9-12</td>
</tr>
<tr>
<td>Y</td>
<td>KR 10-2004-0094450 A (HAN, Young Su) 10 November 2004 See claims 1-2, 8 and figures 1a-2, 13a-13b</td>
<td>10,12</td>
</tr>
<tr>
<td>A</td>
<td>KR 10-0845297 B1 (EUNSUNG TECHNICS CO., LTD.) 10 July 2008 See claims 1-2 and figure 1.</td>
<td>1-12</td>
</tr>
<tr>
<td>A</td>
<td>KR 10-1017133 B1 (FINE IN ARCHITECTS @ ENG, CO., LTD.) 25 February 2011 See claim 1 and figures 1-2.</td>
<td>1-12</td>
</tr>
</tbody>
</table>

☐ Further documents are listed in the continuation of Box C.  ☒ See patent family annex.

* Special categories of cited documents:
  
  "A" document defining the general state of the art which is not considered to be of particular relevance
  
  "E" earlier application or patent but published on or after the international filing date
  
  "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  
  "O" document referred to in an oral disclosure, use, exhibition or other means
  
  "P" document published prior to the international filing date but later than the priority date claimed

  "X" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

  "Y" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

  "Z" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

  "S" document member of the same patent family

Date of the actual completion of the international search

28 JUNE 2017 (28.06.2017)

Date of mailing of the international search report

03 JULY 2017 (03.07.2017)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 109 Seownun-ro, Daejeon 302-701,
Republic of Korea

Facsimile No. +82-42-481-8578

Authorized officer

Telephone No.
<table>
<thead>
<tr>
<th>Patent document cited in search report</th>
<th>Publication date</th>
<th>Patent family member</th>
<th>Publication date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CN 10219912 B</td>
<td>07/05/2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 2011-111996 A3</td>
<td>19/04/2012</td>
</tr>
<tr>
<td>KR 10-1562205 B1</td>
<td>23/10/2015</td>
<td>CN 204972726 U</td>
<td>20/01/2016</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 2016-190468 A2</td>
<td>01/12/2016</td>
</tr>
<tr>
<td>KR 10-0345297 B1</td>
<td>10/07/2008</td>
<td>NONE</td>
<td></td>
</tr>
<tr>
<td>KR 10-1017133 B1</td>
<td>25/02/2011</td>
<td>NONE</td>
<td></td>
</tr>
</tbody>
</table>