

THE METHOD FOR EXTENDING STAIRCASE TYPE
APARTMENT HOUSE AND BUILDING EXTENDED USING
THAT METHOD

5 BACKGROUND OF THE INVENTION

Technical Field

 The present invention relates to the method for extending staircase
type apartment house and building extended using that method, and more
particularly to the method for remodeling the staircase type apartment
10 house into balcony type apartment house that equips excellent livability
and safety while substantially enlarging dwelling space of staircase type
apartment house and the building using that method.

Description of the Background Art

15 An apartment house of which structure provides, between adjacent
dwelling units, with an outdoor staircase for connection with the doorway of
each dwelling unit is commonly called staircase type apartment house.

 Among these staircase type apartment houses, constructions
completed from 1960s to 1970s are deteriorating, so they are in need of
20 urgent rebuilding or something of that sort. However, rebuilding every
existing dwelling unit is realistically not easy and such rebuilding would
produce huge amount of architectural wastes. And yet another problem is
relocation of occupants with the rebuilding.

 These staircase type apartment houses, in which typical occupants
25 live senior citizen, hold yet another problem. For elderly people who live in
the upper floors, it is inconvenient for them to climb up and down the

staircase

Considering the above-mentioned problems, a method to remodel existing staircase type apartment house into balcony type apartment house with newly installed elevator is proposed. (e.g. Refer to the unexamined
5 Japanese Patent Publication Heisei No. 11-159153.)

However, the existing staircase type apartment house contains another problem in addition to the above-mentioned problems. Access to outside is limited to the staircase shared with adjoining dwelling units, so it is difficult to evacuate on the occasion of disaster (e.g. fires, earthquakes
10 and etc.) and such structure does not fully secure privacy among the neighbors. These problems are not solved by the above-mentioned method disclosed in the patent publication because occupants living in adjacent dwelling units share a space in front of their entrance as a doorway, in the same manner as before remodeling.

Also, regarding the relocation matter of occupant with remodeling, some considerations are made to enable occupant keep living while remodeling is conducted. However, remodeling work is conducted at the site adjacent to the room of occupant, so there are considerable impacts on occupant's daily life. Moreover, remodeling of room is impossible with
15 occupant live inside, which eventually forces occupant to deal with decrepit room even after the remodeling of building is completed.

This invention was developed in order to solve all of the above-mentioned conventional problems, and aims to provide a method for extending staircase type apartment house and building extended using that
20 method with the following features. The extended staircase type apartment house has capable of being installed an elevator thereto and has enough

safety on the occasion of disasters (e.g. fires, earthquakes and etc.) and fully secures privacy among neighbors at the same time. Further, using this invention's method, occupant can comfortably keep one's daily life while remodeling is conducted. In addition, this method enables remodeling of
5 inside room without the need of relocation to outside the building.

Summary of Invention:

The present invention according to claim 1 provides an extension method for a staircase type apartment house, between adjacent dwelling
10 units (1), with an outdoor staircase (3) for connection with a doorway (2) of each dwelling unit, said method comprising: providing a foundation part for extension on the outer side of the existing foundation part of the staircase type apartment house; standing a supporting member (4) on the foundation
15 part for extension; providing a roof for extension at the top part of the supporting member above the existing roof of the staircase type apartment house; providing a floor member (6) supported at the middle of the supporting member above the existing roof for forming a new living space
(7) between the floor member and the roof for extension; providing a passage
(11) facing all adjacent dwelling units and interconnecting respective
20 dwelling units; installing an elevator (12) and a staircase (13) at positions facing the passage; and extending a new floor (9) at the same height as the floor height of each floor on the outdoor staircase side or the opposite side; providing an entrance (10) facing the passage for each adjacent dwelling unit independently.

25 The present invention according to claim 2 provides an extension method for a staircase type apartment house according to claim 1, further

comprising: facing said passage to outer sides of dwelling units (1a, 1b) locating at both ends of series of the dwell units so that the passage can form U-shape in plane view; and providing a new balcony on the opposite side of said outdoor staircase.

5 The present invention according to claim 3 provides an extension method for a staircase type apartment house according to claim 1 or 2, further comprising: and after installation of said elevator and said staircase, removing an existing staircase.

10 The present invention according to claim 4 provides an extension method for a staircase type apartment house according to either of claim 1 to 3, further comprising: after formation of said new living space, moving occupants in upper floors of the staircase type apartment house into the new living space to remodel their living space; moving occupants in middle floors of the staircase apartment house into the remodeled living space in
15 said upper floors to remodel their living space; moving occupants in lower floors of the staircase apartment house into the remodeled living space in said middle floors to remodel their living space; and after remodeling living space in the lowest floor, moving new occupants into said remodeled living space in the lowest floor.

20 The present invention according to claim 5 provides a building extended a staircase type apartment house, between adjacent dwelling units, with an outdoor stair case for connection with a doorway of each dwelling unit, said building comprising: a foundation part provided on the outer side of the existing foundation part of the staircase type apartment
25 house; a supporting member stood on said foundation part for extension; a roof for extension provided at the top part of said supporting member above

the existing roof of the staircase type apartment house; a floor member supported at the middle of the supporting member and provided above the existing roof for forming a new living space between the floor member and the roof for extension; a new floor extended at the same height as the floor height of each floor on the outdoor staircase side or the opposite side; a passage facing all adjacent dwelling units and interconnecting respective dwelling units; and an elevator and a staircase installed at positions facing the passage; an entrance facing the passage for each adjacent dwelling unit independently.

10 The present invention according to claim 6 provides a building extended a staircase type apartment house according to claim 5, wherein said passage faces to outer sides of dwelling units locating at the end of series of the dwell units so that the passage can form U-shape in plane view; and a new balcony is provided on the opposite side of said outdoor staircase.

15 The present invention according to claim 7 provides a building extended a staircase type apartment house according to claim 5 or 6, wherein an existing staircase is removed.

20 Brief Description of Drawings:

The present invention is described with reference to the following drawings, wherein like reference numbers denote substantially similar elements:

Fig. 1 is a schematic vertical cross-sectional views showing construction process of the extension method for a staircase type apartment house according to the present invention.

Figs. 2 to 6 show a schematic vertical cross-sectional views showing construction process step by step of the extension method for a staircase type apartment house according to the present invention.

Fig. 7 is a plan view showing a first floor before implementing the
5 extension method.

Fig. 8 is a plan view showing a rooftop before implementing the extension method.

Fig. 9 is a plan view showing the staircase type apartment house under implementation of the extension method.

10 Fig. 10 show a plan view showing the first floor of the staircase type apartment house after implementation of the extension method.

Fig. 11 show a plan view showing the existing floors (second to fifth floors) of the staircase type apartment house after implementation of the extension method.

15 Fig. 12 show a plan view showing the extended floors (sixth to seventh floors) of the staircase type apartment house after implementation of the extension method.

Fig. 13 show a plan view showing the rooftop of the staircase type apartment house after implementation of the extension method.

20 Fig. 14 is a plan view showing a first floor before implementing the extension method.

Fig. 15 show a plan view showing the first floor of the staircase type apartment house after implementation of the extension method.

25 Fig. 16 show a plan view showing the extended floors (sixth to seventh floors) of the staircase type apartment house after implementation of the extension method.

Figs. 17 to 20 show a vertical cross-sectional views showing movement of occupants according to the extension method of the present invention.

5 DESCRIPTION OF THE PREFERRED EMBODIMENTS

Hereinafter, preferred embodiments of the method for extending staircase type apartment house and building extended using that method related to the present invention will be described while referring to the drawings.

The method related to the present invention is the way to remodel the staircase type
10 apartment house provided, between adjacent dwelling units, with an outdoor staircase for connection with the doorway of each dwelling unit, into a balcony type apartment house and to substantially enlarge dwelling space. The building related to the present invention is a balcony type apartment house obtained using this method.

15 Figs. 1 to 6 are schematic vertical cross-sectional views that show an extension method for a staircase type apartment house according to the construction process on this invention. Fig. 7 and Fig. 8 are plan views that show an initial status before implementing the extension method on this invention. Fig. 9 is a plan view that shows the status of staircase type
20 apartment house under implementation of the extension method on this invention. Figs. 10 to 13 are plan views that show the status after implementing the extension method on this invention. And, Fig. 6 and Figs.10 to 13 show the completed status of building on this invention.

It should be noted that embodiments show the case to extend a
25 five-story staircase type apartment house into a seven-story balcony type apartment house and the descriptions hereinafter will be based on these

embodiments here. However, it should be noted that this invention is not limited to the embodiments shown in this specification, but the method can be applied to a four-story or less staircase type apartment house, or a to six-story or more staircase type apartment house. And the building after the
5 extension can be six-story or less, or can be eight-story and more.

It should be noted that Figs. 10 to 13 show the balcony type apartment house after implementation of the method on this invention (after extension). Fig. 10 is a plan view that shows the first floor, Fig. 11 shows the plan view showing the second to fifth floors and, Fig. 12 shows a
10 plan view of the sixth to seventh floors and Fig. 13 shows a plan view of rooftop.

Fig. 1, Fig. 7 and Fig. 8 show the status before implementation on this invention. In these figures a staircase type apartment house provided, between adjacent dwelling units (1), with an outdoor staircase (3) for
15 connection with the doorway (2) of each dwelling unit (1) is shown. Note that Fig. 7 shows the plan view of the first floor and Fig. 8 shows the plan view of the rooftop respectively.

First, in the method on this invention, a foundation part for extension is provided outside of the existing foundation part of the existing
20 staircase type apartment house (hereinafter referred to as existing house) so that the foundation part for extension will surround the existing house's foundation part. On the foundation part for extension, supporting members (4) comprised of steel pillar or something of that sort is stood (refer to Fig.2 and Fig.9). Note that Fig. 2 shows the status after beams are provided as
25 well as the supporting members.

At this step, on the same side or the opposite side of the outdoor

staircase (3), as the supporting member (4), an inner side supporting member (41) placed near the existing house and an outer side supporting member (42) placed outside of the inner side supporting member (41) should be stood. There are some space between the inner side supporting members
5 (41) and the outer side supporting members (42). Figs 2 to 6 show the case when the inner side supporting members (41) and the outer side supporting members (42) are provided on the same side of the outdoor staircase (3), and Figs 9 to 13 show the case when the inner side supporting members (41) and the outer side supporting members (42) are provided on the opposite side of
10 outdoor staircase (3) respectively.

A roof (5) for extension is then provided at the top of the supporting member (4) so that the roof (5) for extension can be located above the existing roof of the staircase type apartment house. A floor members (6) being supported at the middle of the supporting members (4) are provided
15 above the existing roof in order to form new living spaces (7) between the floor members (6) and the roof (5) for extension. Wall members are then attached outside of the supporting members (4) to surround the periphery and the top of the existing house (refer to Fig. 3).

It should be noted that the embodiment shows the case when new
20 living spaces for additional two floors are formed by placing two layers of floor members(6) above the existing house. However, new living spaces (7) can be formed for only additional one floor, or can be formed for additional three or more floors.

It should also be noted that the floor members (6) are preferably
25 installed after roof (5) for extension is provided, yet the floor members (6) may be installed before the roof (5) for extension is provided.

Regarding the acceptable weight to be loaded on the floor of the rooftop formed by the roof (5) for extension can be calculated by multiplying allowable pressure defined as equal to or more than 1800N/m^2 and floorage. By adopting this design, as described later, the rooftop may be utilized for a greenery part (a roof garden) or installation space of power generation device using a solar panel, and may be used for other purposes, to achieve effective utilization of rooftop while contributing to ease heat-island phenomenon or global warming.

After or before forming a new living space (7) according to the above-described manner, a passage (11) is provided to form U-shape in plan view. A passage (11) is provided so that it faces all the adjacent dwelling units (1) and it connects each dwelling unit. A passage (11) is also provided along the side of the dwelling unit (1a, 1b). An elevator (12) and emergency staircases (13) are placed near the side of the outer left end or near the right end of the passage (11) as shown by the plan view.

When the inner side supporting members (41) and the outer side supporting members (42) are provided on the same side of the outdoor staircase (3) as shown in Figs. 2 to 6, the outer and the inner edges of the newly installed passage (11) will be supported by the supporting members (41 and 42). When the inner side supporting members (41) and the outer side supporting members (42) are provided on the opposite side of the outdoor staircase as shown in Figs. 9 to 13, the newly installed passage (11) will be supported by just the outer edge.

Additionally, the shape of passage (11) in plan view is not necessarily limited to the U-shape as described in the embodiments but the passage (11) can be formed in any annular shape. For example, square,

round, oval or other shapes so that the passage can surround the entire adjacent dwelling units.

The preferable places to provide an elevator (12) and emergency staircases (13) at a position facing to the passage (11) along the side of the outer ends of the dwelling unit (1a, 1b), as described in Figs 10 to 12, so that occupants can safely evacuate on the occasions of disasters such as fires, earthquakes and so on. As described in the embodiments, emergency stair (13) needs to be provided at both ends of the passage, right end and left end. As for the elevator (12), it can be installed at both ends, or it just should be installed at least in either side. Also, in the case when pitch of building needs to be restricted due to sunlight condition, the elevator (12) and the emergency staircase (13) can be installed at a location facing the passage (11) which is the front side of the dwelling unit (the same side of the outdoor staircase used to be located) instead of the side of dwelling unit (1a, 1b).

Extension of floors in horizontal direction of existing house is carried out after the passage (11), the elevator (12) and the emergency staircase (13) are newly installed according to the above-described method.

A new floor (9) is extended at the same height as the floor height of each floor on the outdoor staircase (3) side and/or the opposite side to extend floor in horizontal direction. Note that in this specification, the same side of out door staircase of the existing house is referred to as front-side and the opposite side is referred to as backside for the sake of convenience.

As described in Figs. 10 to 12, this new floor (9) may be installed both on the same side of outdoor staircase (3) and on the opposite side. Otherwise as described in Figs. 3 to 6, the new floor (9) can be provided on the same side of outdoor staircase (3).

In the positions facing the passage (11) newly installed, an entrance (10) for two adjacent dwelling units between which an outdoor staircase (3) is positioned is installed independently wherefrom occupants can go out to the passage (11) directly. In the case in which the new floor (9) is installed on the opposite side of the outdoor staircase (3), as shown in Figure 10-12, a part of the existing room are transformed into the entrance (10) while, in the case in which new floor (9) is installed on the same side of the outdoor staircase (3), the entrance (10) is formed on new floor (9).

In this way, by forming independently the entrances (10) of the two adjacent dwelling units between which the outdoor staircase (3) is positioned so that these entrances can face to the passage (11), evacuation routes in case of earthquake or fire for each dwelling unit are secured and, as a result, safety in case of earthquake or fire is improved. The entrances respectively formed further facilitate free entrance and exit for each dwelling unit without bothering the neighbors with noise.

Installation of the respective entrances further provides spacious doorway as one in a solitary house to an apartment house. If the existing entrance door is replaced with glass windows, enough sunlight into living rooms is secured.

On the new floor (9) provided on the opposite side of the outdoor staircase (3), new balconies (16) are provided and the balconies for the dwelling units (1a, 1b) is formed facing to passage (11). The occupants of the dwelling units (1a, 1b) can escape to the passage (11) via balconies (16) in case of emergency, even when it is impossible for them to escape via entrance (10). The occupants of dwelling units (1c, 1d) can also escape via the balconies of dwelling units (1a, 1b).

The present invention can be applied to the cases in which the number of the adjacent dwelling units on one floor of the existing staircase type apartment house is two or more than six, although the figures show four dwelling units.

5 It is desirable that the outdoor staircases (3) should be removed before the new floor (9) is extended on the side of the outdoor staircases(3). However the removal of the outdoor staircases is not necessary particularly when the occupants do not prefer the removal. The figures show the case in which the existing outdoor staircases (3) have been removed.

10 If the existing outdoor staircases (3) are removed, the space resulting from the removal may be used as the space for pipe shaft installation or for greenery. If the outdoor staircases (3) remain, this increases evacuation routes.

 Pipe shaft (P), in an ordinary staircase type apartment house, is
15 provided one for every two adjacent dwelling units as shown in Figure 7. In the present invention, it is desirable to add pipe shafts (P) so that each dwelling unit is provided with one pipe shaft. Existing pipe shafts can be used for a new purpose.

 For the removal of the outdoor staircases (3), it is preferable to
20 follow the sequence as described below. First, the outdoor staircases (3) of the upper floors are removed and new floors (9) are provided on the upper floors and then the outdoor staircases (3) of the lower floors are removed (Figure 4 and Figure 5). Figure 4 shows the appearance of the whole apartment house wherein the outdoor staircases (3) of the third floor and
25 the floors over the third floor are removed and on the fourth floor and fifth floor new floors (9) are provided. Figure 5 shows the appearance of the

whole apartment house wherein the outdoor staircases (3) are removed on the second floor and the upper floors and new floors (9) are provided, in addition, on the second and the third floor. Figure 6 shows the appearance of the whole apartment house wherein the outdoor staircases of the all floors
5 are removed and a new floor (9) and a passage (11) are provided on the first floor.

Concrete can be placed at a juncture between the passage (11) newly provided and the existing dwelling unit (1) or the passage (11) and a new floor (9) so as to connect them integrally. However, connecting by an
10 expansion joint is preferable because it can prevent footsteps on passage (11) from being directly transmitted into a room and vibration from an earthquake from being transmitted to the existing dwelling parts.

In Figure 10 and Figure 11, the dotted circle shows the positions of the expansion joint.

15 A greenery part (14) and a solar panel (15) can be installed on the roof (5) for extension and on the external surface of the wall member attached to the opposite side of the outdoor staircase (3) (Figure 6 and Figure 13). By installing the greenery part (14) and the solar panel (15) on an outer wall as well as on the housetop, the percentage of space covered
20 with green is increased. Therefore the heat island effect can be reduced effectively. The greenery and the solar panel further reduce the increasing CO₂ and as a result the apartment house can contribute to the prevention of the global warming. Greenery installed on the housetop (a roof garden) presents a place of recreation and relaxation for the occupants.

25 It is preferable to create an artificial ground on the housetop above the roof (5) for extension and install a roof garden (greenery part) thereon.

On the artificial ground, a greenhouse for cultivating plants or a surrounded place for keeping animals can be installed.

In the building method described above, it is possible to assemble members processed in advance or integrate a dwelling unit (infill), using the
5 prefabricating method or the unit method, in addition to the known traditional building techniques.

As Figure 10 shows, an entrance hall (20) can be installed on the first floor.

Figure 7-13 described above show the extension method for the case
10 in which the outdoor staircase of the existing house faces north. Extension method for the case in which the outdoor staircase of the existing house faces south is shown in Figure 14-16.

Figure 14 is the ground plan showing an apartment house before the extension is practiced using the method of the present invention. Figure 15
15 and Figure 16 are the ground plan showing an apartment house after the extension is practiced using the method of the present invention. In the figures after extension, just a part of floors are shown. Figure 14 and Figure 15 show the first floor (existing floor) and Figure 16 shows the sixth floor and the seventh floor (extended floors).

20 The essential part of the extension method for the case in which the outdoor staircase faces north is similar to the case in which the outdoor staircase faces south. Therefore same constituents present in both cases are indicated with the same mark in the drawings. Only different parts between both cases are described below.

25 The existing balconies (17) are on the same side of the outdoor staircase (3) in the case in which the outdoor staircase faces south, while the

existing balconies (17) are on the opposite side of the outdoor staircase (3) in the case in which the outdoor staircase faces north. This leads to differences in a part of the method for extension.

More specifically, the passage (11) is provided on the opposite side of
5 the existing balconies (17) in the case of north facing while the passage (11) is provided on the same side of the existing balcony (17) in the case of south facing. Therefore, in the case of south facing, a part of the existing balconies (17) can be used for providing the entrance (10).

In the space resulting from removing the outdoor staircases (3), a
10 toilet or a bathroom can be provided.

Next, the handling of the occupants in the method of the present invention is described in the reference of Figure 17-20. Note that arrows in Figure 17-20 indicate transfer of the occupants.

After formation of new living spaces (7) (the sixth floor and the
15 seventh floor in the example shown in Figure 17) above the existing house, the occupants in the upper floors of the existing house are moved into the living spaces (7) and then the living space of the said upper floors are remodeled as shown in Figure 17.

Then the occupants in the middle floors of the existing house (the
20 second floor and the third floor in the example shown in Figure 18) are moved to these remodeled upper floors and then the living spaces of the middle floors are remodeled (Figure 18).

Then the occupants in the lower floors (the first floor in the example shown in the Figure 19) are moved to these remodeled middle floors and
25 then the living spaces of the lower floors are remodeled (Figure 19).

After the living space of the lowest floor is remodeled, finally, new

occupants are introduced to the living spaces in the lowest floor remodeled (Figure20).

In this way, the present invention creates the new living space above the existing house, which means that the occupants do not need a large-scale move to the outside of the building but a simple move inside the building. This minimizes the cost of a move. The present invention further enables a living space remodel simultaneous with the reconstruction of the building, which was impossible with the traditional reconstruction method for a staircase type apartment house.

As described above, the method for extending staircase type apartment house saves the occupants from a move to the outside of the building and secures them a comfortable daily life during the extension construction. The method further enables the living space remodel. The building extended by the present invention can have an elevator so as to be comfortable for elderly people, and also ensure evacuation routes in case of disasters such as fire and earthquake. The building prevents occupants' privacy from being invaded by their neighbors.

WHAT IS CLAIMED IS:

1. An extension method for a staircase type apartment house, between adjacent dwelling units (1), with an outdoor staircase (3) for connection with a doorway (2) of each dwelling unit, said method comprising:

5 providing a foundation part for extension on the outer side of the existing foundation part of the staircase type apartment house; standing a supporting member (4) on the foundation part for extension;

10 providing a roof for extension at the top part of the supporting member above the existing roof of the staircase type apartment house;

providing a floor member (6) supported at the middle of the supporting member above the existing roof for forming a new living space (7) between the floor member and the roof for extension;

15 providing a passage (11) facing all adjacent dwelling units and interconnecting respective dwelling units;

installing an elevator (12) and a staircase (13) at positions facing the passage; and

20 extending a new floor (9) at the same height as the floor height of each floor on the outdoor staircase side or the opposite side;

providing an entrance (10) facing the passage for each adjacent dwelling unit independently.

2. An extension method for a staircase type apartment house according to claim 1, further comprising:

facing said passage to outer sides of dwelling units (1a, 1b) locating at both ends of series of the dwell units so that the passage can form U-shape in plane view; and providing a new balcony on the opposite side of said outdoor staircase.

3. An extension method for a staircase type apartment house according to claim 1 or 2, further comprising: and after installation of said elevator and said staircase, removing an existing staircase.

10 4. An extension method for a staircase type apartment house according to either of claim 1 to 3, further comprising:
after formation of said new living space, moving occupants in upper floors of the staircase type apartment house into the new living space to remodel their living space;
15 moving occupants in middle floors of the staircase apartment house into the remodeled living space in said upper floors to remodel their living space;
moving occupants in lower floors of the staircase apartment house into the remodeled living space in said middle floors to remodel their living space; and
20 after remodeling living space in the lowest floor, moving new occupants into said remodeled living space in the lowest floor.

5. A building extended a staircase type apartment house, between adjacent dwelling units, with an outdoor stair case for connection
25 with a doorway of each dwelling unit, said building comprising:
a foundation part provided on the outer side of the existing

foundation part of the staircase type apartment house;

a supporting member stood on said foundation part for extension;

a roof for extension provided at the top part of said supporting member above the existing roof of the staircase type apartment house;

a floor member supported at the middle of the supporting member and provided above the existing roof for forming a new living space between the floor member and the roof for extension;

a new floor extended at the same height as the floor height of each floor on the outdoor staircase side or the opposite side;

a passage facing all adjacent dwelling units and interconnecting respective dwelling units; and

an elevator and a staircase installed at positions facing the passage;

an entrance facing the passage for each adjacent dwelling unit independently.

6. A building extended a staircase type apartment house according to claim 5, wherein said passage faces to outer sides of dwelling units locating at the end of series of the dwell units so that the passage can form U-shape in plane view; and

a new balcony is provided on the opposite side of said outdoor staircase.

7. A building extended a staircase type apartment house according to claim 5 or 6, wherein an existing staircase is removed.