

## Method of removing sash window's outer frame

The present invention relates to a method of removing an outer frame of an existing aged sash window from a window opening in a building wall for replacement of such an old sash window with a new one.

5 In replacement of an existing aged sash window with a new one, attempts have been made to remove an outer frame of such an old sash window from a window opening in a building wall. To this end, it is customary to push down the outer frame to the exterior side of the window opening  
10 after breaking or chipping the building wall edges around the window opening. However, this chipping causes cracks or other damage in the building wall, which must be restored to original condition for installation of a new outer frame.

15 A solution has been proposed by Japanese Patent Laid-Open Publication (Tokkaisho) 56-89683 in which a rectangular outer frame is separated into four corner sections and four remaining straight sections by cutting each of the four frame members at its opposite end  
20 portions, and thereafter the four corner sections and the four straight sections are removed one after another from the building wall by pulling each one frame section inwardly of the window opening. In this prior method, eight frame sections in all need to be removed, which is  
25 laborious and time-consuming.

According to the present invention there is provided a method of removing an outer frame of a sash window from a window opening in a building wall, the outer frame being composed of an upper horizontal member, a lower horizontal member, a lefthand side member and a righthand side member joined together at their ends to provide a rectangular configuration having four corners where the joins are, said method comprising the steps of:-

5 (a) separating the outer frame into two or four frame section by two or four cuts in the outer frame away from the actual corners, with no more than two cuts in any one of said members, so that at least a portion of each member remains joined to a portion of an initially adjoining member at a respective one of  
10 the corners; and

(b) then removing the separated frame sections of the outer frame one after another from the building wall by pulling each one frame section inwardly of the window opening.

20 It is believed possible by means of the invention to provide a method of removing an outer frame of an existing sash window from a window opening in a building wall easily and speedily without breaking or chipping the building wall edges around the window opening.

25 The invention will be described by way of examples with reference to the accompanying drawings, wherein:-

Fig. 1 is a front elevational view of a sash window's outer frame mounted within a window opening in a building wall, illustrating a method in accordance with the present  
30 invention;

FIGS. 2, 3 and 4 are views similar to FIG. 1, illustrating various modified embodiments;

FIG. 5 is an enlarged fragmentary vertical cross-sectional view of FIGS. 1 through 4, illustrating the manner in which a lower horizontal member of the outer frame is pulled out from the building wall;

FIG. 6 is a cross-sectional view similar to FIG. 5, illustrating the manner in which an upper horizontal frame member is pulled out from the building wall; and

FIG. 7 is an enlarged fragmentary horizontal cross-sectional view of FIGS. 1 through 4, illustrating the manner in which one of a pair of vertical frame members is pulled out from the building wall.

FIG. 1 shows a rectangular metallic outer frame 1 (of an existing sash window which is aged and hence is to be replaced with a new one) mounted within a window opening in a building wall 2, with one or more sashes (not shown) having been previously removed. Around the window opening, the building wall 2 has a pair of confronting upper and lower parts 2a, 2b and a pair of confronting side parts 2c, 2d. The rectangular outer frame 1 includes a pair of confronting upper and lower horizontal frame members 3, 4 and a pair of confronting vertical frame members or side jambs 5, 6 joined with the horizontal frame members 3, 4 at their ends. Thus the outer frame 1 has four right-angle corners 1a, 1b, 1c, 1d. The upper and lower horizontal frame members 3, 4 are fixedly secured to the upper and

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lower parts 2a, 2b, respectively, of the building wall 2 by means of respective anchors 40, 40; 41, 41. Likewise, the confronting vertical frame members 5, 6 are fixedly secured to the confronting side walls 2c, 2d, respectively, of the building wall 2 by means of respective anchors 42, 42; 43, 43.

To remove the outer frame 1 from the window opening in the building wall 2, the outer frame 1 is separated into four frame sections by cutting each of the confronting vertical frame members 5, 6 at 13 and thus at its upper and lower end portions 5a, 5b; 6a, 6b. As a result, the upper right and upper left end portions 5a, 6a are separated from the remainders of the respective vertical frame members 5, 6 and remain joined to the upper frame member 3. The lower right and lower left end portions 5b, 6b are separated from the remainders of the respective vertical frame members 5, 6 and remain joined to the lower frame member 4.

Then the four separated frame sections are removed one after another from the building wall 2 in the following manner and in a desired order. The upper frame member 3, with the upper right and upper left end portions 5a, 6a is removed from the upper wall part 2a by pulling inwardly of the window opening, i.e in the direction of an arrow 7. Likewise, the lower frame member 4, with the lower right and lower left end portions 5b, 6b is removed from the lower wall part 2b by pulling inwardly of the window opening, i.e in the direction of an arrow 8. Each of the remaining portions of the vertical frame members 5, 6 is removed from the right and

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left side wall parts 2c, 2d, respectively, by pulling inwardly of the window opening, i.e in the direction of arrows 11, 12.

FIG. 2 illustrates a second embodiment, in which the outer frame 1 is separated into four frame sections by cutting each of the confronting upper and lower frame members 5, 6 at 13 and thus separating from the remainder its right and left end portions 3a, 3b; 4a, 4b. As a result, the upper right and lower right end portions 3a, 4a are separated from the remainders of the respective horizontal frame members 3, 4 and remain joined to the right vertical frame member 5. The upper left and lower left end portions 3b, 4b are separated from the remainders of the respective horizontal frame members 3, 4 and remain joined to the left vertical frame member 6. Then the four separated frame sections are removed one after another from the building wall 2 by pulling each one frame section inwardly of the window opening.

In a third embodiment shown in FIG. 3, the outer frame 1 is separated into two frame sections by cutting each of the vertical frame members 5, 6 at 13 and thus at its midportion. As a result, the upper half 5A, 6A of each vertical frame member 5, 6 with a respective one of the upper right and upper left corners 1a, 1b is separated from the lower half 5B, 6B of the respective vertical frame member 5, 6 and remains joined to the upper frame member 3. The lower half 5B, 6B of each vertical frame member 5, 6 with a respective one of the lower right and lower left corners 1c, 1d is separated from the upper

half 5A, 6A of the respective vertical frame member 5, 6 and remains joined to the lower frame member 4. Then the two separated frame sections are removed one after another from the building wall 2 by pulling the respective horizontal frame members 3, 4 inwardly of the window opening, i.e in the direction of arrows 7, 8.

In a fourth embodiment shown in FIG. 4, the outer frame 1 is separated into four frame sections by cutting each of the four frame members 3, 4, 5, 6 at 13 and thus at one of its opposite end portions 3a, 4b, 5b, 6a. As a result, the upper right end portion 3a is separated from the remainder of the upper horizontal frame member 3 and remains joined to the right vertical frame member 5. The lower right end portion 5b is separated from the remainder of the right vertical frame member 5 and remains joined to the lower horizontal frame member 4. The lower left end portion 4b is separated from the remainder of the lower horizontal frame member 4 and remains joined to the left vertical frame member 6. The upper left end portion 6a is separated from the remainder of the left vertical frame member 6 and remains joined to the upper horizontal frame member 3. Then the four separated frame sections are removed one after another from the building wall 2 by pulling each one frame section inwardly of the window opening.

FIG. 5 illustrates the manner in which the lower horizontal member 4 of the outer frame 1 (FIGS. 1-4) is pulled inwardly of the window opening, using a pulling apparatus well know in the art. The pulling apparatus

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comprises a support 14, a first and a second arm 15, 16  
(each arm is slidably mounted on the support 14 and is

adapted to be fixed at a desired position on the support 14), a pair of hooks 18, 18 connected by a rope 17, and a lever-actuated chain block 19. The chain block 19 is adapted to wind up a chain 20 by pivoting a handle 21  
5 upwardly and downwardly through a predetermined angle.

The support 14 is put on the interior side of the window opening with its upper and lower end portions 14a, 14b disposed against the respective interior side 2a', 2b' of the upper and lower wall parts 2a, 2b and also with its  
10 lower end 14b' disposed against a floor 22. The second arm 16 is fixed on the support 14 in such a position as to contact an upwardly facing surface 2b" of the lower wall part 2b. The lever-operated chain block 19 is hung by a chain 23 from the first arm 15, which is fixed to the  
15 support 14 in a predetermined position. With the two hooks 18, 18 in engagement with the lower frame member 4, the rope 17 is threaded through a shackle 24 that is connected to a lower or free end of the chain 20 hanging from the chain block 19.

20 When the handle 21 of the chain block 19 is pivoted upwardly and downwardly several times through a predetermined angle to wind up the chain 20, the rope 17 and thus the hooks 18, 18 are pulled upwardly together with the lower frame member 4. As a result, the lower frame member  
25 4 is pulled out from the lower wall part 2b. During that time, because with the second arm 16 as a fulcrum, a falling moment M1 acts on the support 14 due to this pulling force so as to urge the upper end portion 14a

against the interior side 2a' of the upper wall part 2a, the support 14 is kept from falling down to the interior side of the building. Accordingly, the lower frame member 4 is pulled out from the building wall 2 assuredly.

5        FIG. 6 illustrates the manner in which the upper horizontal member 3 of the outer frame 1 (FIGS. 1-4) is pulled inwardly of the window opening, using the pulling apparatus of FIG. 4. The support 14 is put on the interior side of the window opening, with the upper and lower (lower and upper in FIG. 6) end portions 14a, 14b disposed against the respective interior side 2b', 2a' of the lower and upper wall parts 2b, 2a and also with its lower (upper in FIG. 6) end 14b' disposed against a ceiling 25. The second arm 16 is fixed to the support 14 in such a position as to  
10        contact a downwardly facing surface 2a" of the upper wall part 2a. With the two hooks 18, 18 in engagement with the upper frame member 3, the rope 17 is hung from the upper frame member 3. The lever-operated chain block 19 is supported between the rope 17 and the first arm 15 via the  
15        chains 20, 23, the rope 17 being threaded through the shackle 24 connected to the free end of the chain 20.

When the handle 21 of the chain block 19 is pivoted upwardly and downwardly several times through a pre-determined angle to wind up the chain 20, the rope 17 and  
20        thus the hooks 18, 18 are pulled downwardly together with the upper frame member 3. As a result, the upper frame member 3 is pulled out from the upper wall part 2a. During that time, because with the second arm 16 as a fulcrum, a



falling moment M2 acts on the support 14 due to this pulling force so as to urge the upper (lower in FIG. 6) end portion 14a against the interior side 2b' of the lower wall part 2b, the support 14 is kept from falling down to the interior side of the building. Accordingly, the upper frame member 3 is pulled out from the building wall 2 assuredly.

FIG. 7 illustrates the manner in which the right (left in this Figure) vertical member 5 of the outer frame 1 (FIG. 1 and 4) is pulled inwardly of the window opening, using the pulling apparatus of FIGS. 5 and 6. The support 14 is put on the interior side of the window opening, with the upper and lower (right and left in FIG. 7) end portions 14a, 14b disposed against the respective interior side 2c', 2d' of the confronting side wall parts 2c, 2d and also with its lower (left in FIG. 7) end 14b' disposed against an interior member 27 of the side wall part 2c. The second arm 15 is fixed to the support 14 in such a position as to contact a rightwardly facing surface 2c" of the side wall part 2c. With the two hooks 18, 18 in engagement with the vertical frame member 5, the rope 17 is threaded through the shackle 24 connected to the free end of the chain 20. The lever-operated chain block 19 is supported between the rope 17 and the first arm 15 via the chains 20, 23.

When the handle 21 of the chain block 19 is pivoted rightwardly and leftwardly several times through a predetermined angle to wind up the chain 20, the rope 17 and thus the hooks 18, 18 are pulled rightwardly together

with the vertical frame member 5. As a result, the vertical frame member 5, is pulled out from the side wall part 2c. During that time, because with the second arm 16 as a fulcrum, a falling moment M3 acts on the support 14 due to this pulling force so as to urge the upper (right in FIG.7) end portion 14a against the interior side 2d' of the side wall part 2d, the support 14 is kept from falling down to the interior side of the building. Accordingly, the right (left in FIG. 7) vertical frame member 5 is pulled out from the building wall 2 assuredly.

The left (right in FIG. 7) vertical frame member 6 is pulled out from the building wall 2 in the same manner as the right vertical frame member 5 is.

In any of the embodiments of FIGS. 1 to 4, since at least a portion of each member 3 to 6 remains joined to a portion of an initially adjoining member at a respective one of the four corners 1a to 1d, either just two frame sections or at most only four frame sections in all (compared with eight in the prior method according to Japanese Patent Laid-Open Publication 56-89683) need to be pulled out to complete the removing of the outer frame 1.

Another advantage of the present method is that the removing of the outer frame 1 can be accomplished without breaking or chipping the building wall edges around the window opening.

We refer to our co-pending application No. 83 24468 (Serial No. 2 130 279) of even date herewith.

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CLAIMS:-

1. A method of removing an outer frame of a sash window from a window opening in a building wall, the outer frame being composed of an upper horizontal member, a lower horizontal member, a lefthand side member and a righthand side member joined together at their ends to provide a rectangular configuration having four corners where the joins are, said method comprising the steps of:

(a) separating the outer frame into two or four frame sections by two or four cuts in the outer frame away from the actual corners, with no more than two cuts in any one of said members, so that at least a portion of each member remains joined to a portion of an initially adjoining member at a respective one of the corners; and

(b) then removing the separated frame sections of the outer frame one after another from the building wall by pulling each one frame section inwardly of the window opening.

2. A method according to claim 1, in which said separating into four frame sections is performed by cutting each of one confronting pair of the frame members near its opposite end portions.

3. A method according to claim 1, in which said separating into four frame sections is performed by cutting each of the four frame members near one end thereof so



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that each cut is near a different corner from the corner that each of the other cuts is respectively near.

4. A method according to claim 1, in which said separating into two frame sections is performed by cutting each of one confronting pair of the frame members at its  
5 midportion.

5. A method of removing an outer frame of a sash window from a window opening in a building wall substantially as described with reference to and as illustrated in Figures 1 and 5 to 7 of the accompanying drawings.

10 6. A method of removing an outer frame of a sash window from a window opening in a building wall substantially as described with reference to and as illustrated in Figures 2 and 5 to 7 of the accompanying drawings.

15 7. A method of removing an outer frame of a sash window from a window opening in a building wall Figures 3 and 5 to 7 of the accompanying drawings.

8. A method of removing an outer frame of a sash window from a window opening in a building wall  
20 substantially as described with reference to and as illustrated in Figures 4 and 5 to 7 of the accompanying drawings.

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