

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, an outer frame of such an old sash window needs to be removed from a window opening in a building wall. To this end, a known method, as disclosed in Japanese Utility Model Laid-Open Publication (Jikkaisho) 56-124136,
10 comprises: pulling a pair of upper and lower members of the old outer frame inwardly of the window opening until they are detached from the building wall to such an extent that a pair of side jambs of the outer frame is inwardly bent at their upper and lower end portions; and then
15 removing the two side jambs one after another from the building wall by pulling at least one of the upper and lower bent portions of the respective side jamb inwardly of the window opening. However, the upper and lower frame members having been detached from the building wall remain
20 disposed in the window opening and hence serve as obstacles during the removal of the side jambs, requiring a greater amount of pulling force. In this prior method, it is necessary to use a special pull-out tool to detach the side jambs from the building wall in addition to an

ordinary pulling apparatus which is used to detach the upper and lower frame members from the building wall.

According to the present invention there is provided a method of removing a rectangular outer frame of a sash window from a window opening in a building wall, the rectangular outer frame being composed of a pair of confronting first frame members and a pair of confronting second frame members joined with the first frame members at their ends, each of said second frame members being bendable at its opposite end portions, said method comprising the steps of:

5 (a) pulling the first frame members of the outer frame inwardly of the window opening until each of the second frame members is bent at its opposite end portions;

15 (b) cutting each of the opposite bent end portions of each second frame member so as to separate an endmost section of each bent end portion from the respective second frame member;

(c) then removing the first frame members from the window opening, each together with the two endmost sections of the second frame members which portions are contiguous to the respective first frame member; and

20 (d) finally removing the second frame members one after another from the building wall by pulling at least one of the remaining bent end portions of the respective second frame member inwardly of the window opening.

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One example of such method comprises the steps of:

pulling a pair of upper and lower members of the outer frame inwardly of the window opening until a pair of
5 side jambs of the outer frame is inwardly bent at their upper and lower end portions; cutting each of the bent end portions centrally thereof; then removing the upper and lower members from the window opening, each together with two endmost portions of the side jambs which
10 portions are contiguous to a respective one of the upper and lower frame members, and finally removing the side jambs one after another from the building wall by pulling at least one of the remaining bent portions of the respective side jamb inwardly of the window
15 opening.

Conversely, in another example of such method, two side jambs are firstly pulled until the upper and lower frame members are bent at their end portions, and then upper and lower frame members are cut at each of
20 the bent end portions; after the side jambs are removed from the window opening, the upper and lower frame members are removed one after another from the building wall by pulling at least one of the remaining bent end portions of a respective one of the upper and lower

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frame members.

It is believed possible by means of the invention to provide a method of removing an outer frame of an existing sash window frame from a window opening in a building wall, in which a pair of upper and lower frame members and a pair of side jambs can be removed one pair after another pair easily and speedily without obstruction by each other pair, thus requiring no special pull-out tool in addition to an ordinary pulling apparatus.

Another believed possibility of the invention is to provide a method of removing an outer frame of an existing sash window from a window opening in a building wall, in which cutting of the outer frame can be performed expeditiously not only without being obstructed by the building wall around the window opening, but also without damaging any part of the building wall.

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

FIGS. 1 through 3 are fragmentary cross-sectional views illustrating a series of progressive steps of a method of removing an outer frame of an existing sash window from a window opening in a building wall;

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

5 FIG. 5 is a cross-sectional view similar to FIG. 4, illustrating the manner in which an upper horizontal frame member is pulled out from the building wall;

FIG. 6 is an enlarged fragmentary horizontal cross-sectional view of FIG. 3, illustrating the manner in which one of a pair of vertical frame members is pulled out from the building wall;

FIGS. 7 through 9 are cross-sectional views similar to FIGS. 1 through 3, illustrating a second embodiment;

15 FIG. 10 is an enlarged fragmentary horizontal cross-sectional view of FIG. 7 illustrating the manner in which one of a pair of vertical frame member is pulled out from the building wall; and

FIG. 11 is an enlarged fragmentary vertical cross-sectional view of FIG. 9, illustrating the manner in which an upper horizontal frame member 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 25 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. The upper and lower horizontal frame members 3, 4 are fixedly secured to the upper and lower parts 2a, 2b, respectively, of the building wall 2. Likewise, the two vertical frame members 5, 6 are fixedly secured to the two side parts 2c, 2d, respectively, of the building wall 2.

To remove the outer frame 1 from the window opening in the building wall 2, the upper and lower members 3, 4 are pulled inwardly of the window opening (i.e., in the directions of arrows 7, 8 in FIG. 1) until they are detached from the upper and lower wall parts 2a, 2b, respectively, to such an extent that each of the vertical frame members 5, 6 is inwardly bent at its upper and lower end portions 9, 10, contiguous to the upper and lower frame members 3, 4, respectively. As a result, each vertical frame member 5, 6 is partly detached from the respective side wall part 2c, 2d, with its upper and lower end portions 9, 10 raised from the building wall 2, as shown in FIG. 2.

Then each of the bent end portions 9, 10 is cut centrally thereof at 13 (FIGs. 2 and 3); an endmost section

9a, 10a of each bent end portion 9, 10 is thus separated from the respective vertical frame member 5, 6. The upper frame member 3, with the upper endmost sections 9a, 9a of the two vertical frame members 5, 6 is removed from the window opening, as shown in FIG. 3. Likewise, the lower frame member 4, with the lower endmost sections 10a, 10a of the two vertical frame members 5, 6, is removed from the window opening.

Finally, the two vertical frame members 5, 6 are removed one after another from the respective side wall parts 2c, 2d by pulling at least one of the remaining bent end portions 9b, 10b of the respective vertical frame member 5, 6 inwardly of the window opening, i.e. in the directions of arrows 11, 12 (FIG. 3).

FIG. 4 illustrates the manner in which the lower horizontal member 4 of the outer frame 1 is pulled inwardly of the window opening, using a pulling apparatus well known in the art. The pulling apparatus 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 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 lower end 14b' disposed against a floor 22. The second arm 16 is fixed on the support 14 in such a position as to
5 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 support 14 in a predetermined position. With the two hooks 18, 18 in engagement with the lower frame member 4, the
10 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.

When the handle 21 of the chain block 19 is pivoted upwardly and downwardly several times through a
15 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 4 is pulled out from the lower wall part 2b. During that time, because with the second arm 16 as a fulcrum, a
20 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
25 4 is pulled out from the building wall 2 assuredly.

FIG. 5 illustrates the manner in which the upper horizontal member 3 of the outer frame 1 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. 5) end portions 14a, 14b disposed against the
5 respective interior side 2b', 2a' of the lower and upper wall parts 2b, 2a and also with its lower (upper in FIG. 5) end 14b' disposed against a ceiling 25. The second arm 16 is fixed to the support 14 in such a position as to contact a downwardly facing surface 2a" of the upper wall part 2a.
10 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 chains 20, 23, the rope 17 being threaded through the shackle 24
15 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 predetermined angle to wind up the chain 20, the rope 17 and thus the hooks 18, 18 are pulled downwardly together
20 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.
25 5) 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. 6 illustrates the manner in which one of the vertical frame members 5 is pulled inwardly of the window opening, using virtually the same pulling apparatus as that used in FIGS. 4 and 5. In place of the hooks 18, 18, at least one clamp 26 is used to grip at least one of the upper and lower remaining bent end portions 9b, 10b (only the upper remaining bent end portion 9b is shown for clarity) of the vertical frame member 5 in a manner described below.

The support 14 is put on the interior side of the window opening, with the upper and lower (right and left in FIG. 6) end portions 14a, 14b disposed against the respective interior side 2c', 2d' of the two side wall parts 2c, 2d and also with its lower (left in FIG. 6) end 14b' disposed against an interior member 27 of the left side wall part 2c. The second arm 16 is fixed to the support 14 in such a position as to contact an inwardly (rightwardly) facing surface 2c" of the right side wall part 2c.

At least one of the remaining bent end portions 9b, 10b of the vertical frame member 5 is gripped by the respective clamp 26, i.e. by a pair of threaded bolts 28, 28, each extending threadedly through a bracket 29 and terminating in a spiked or notched inner end 30. The bracket 29 is connected to the rope 17. 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
5 predetermined angle to wind up the chain 20, the rope 17 and thus the clamp 26 is pulled rightwardly together with the vertical frame member 5. As a result, the left vertical frame member 5 is pulled out from the left side wall part 2c. During that time, because with the second
10 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. 6) end portion 14a against the interior side 2d' of the right side wall part 2d, the support 14 is kept from falling down to the interior side
15 of the building. Accordingly, the left vertical frame member 5 is pulled out from the building wall 2 assuredly.

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

20 — Conversely, in another embodiment of FIGS. 7 through 9, the two vertical members 105, 106 of the outer frame 101 are firstly pulled inwardly of the window openings (i.e. in the directions of arrows 107, 108 in FIG. 7) until the upper and lower frame members 103, 104 are bent at their
25 right and left end portions 109, 110 (FIG. 8). Then each of the bent end portions 109, 110 is cut at 113 (FIG. 8); an endmost section 109a, 110a of each bent end portion 109,

110 is thus separated from the respective horizontal frame members 103, 104. The right vertical frame member 105, with the right endmost portions 109a, 109a of the two horizontal frame members 103, 104, is removed from the window opening, as shown in FIG. 9. Likewise, the left vertical frame member 106, with the left endmost sections 110a, 110a of the two horizontal frame members 103, 104, is removed from the window opening. Finally, the upper and lower frame members 103, 104 are removed one after another from the upper and lower wall parts 2a, 2b, respectively, by pulling at least one of the remaining bent end portions 109b, 110b of the respective horizontal frame member 103, 104 inwardly of the window opening.

FIG. 10 illustrates the manner in which the right (left in this Figure) vertical member 105 of the outer frame 101 is pulled inwardly of the window opening, using the pulling apparatus of FIGS. 4 and 5. The support 14 is put on the interior side of the window opening, with the upper and lower (right and left in FIG. 10) 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. 10) 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 105, 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
 5 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 105. As a result, the vertical frame member 105 is pulled out from the the side
 10 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. 10) end portion 14a against the interior side 2d' of the side wall part 2d, the support 14
 15 is kept from falling down to the interior side of the building. Accordingly, the right (left in FIG. 10) vertical frame member 105 is pulled out from the building wall 2 assuredly.

The left (right in FIG. 10) vertical frame member 106
 20 is pulled out from the building wall 2 in the same manner as the right vertical frame member 105 is.

FIG. 11 illustrates the manner in which the upper horizontal frame member 103 is pulled downwardly, i.e. inwardly of the window opening, using the pulling apparatus
 25 of FIG. 6. The support 14 is put on the interior side of the window opening, with the upper and lower (lower and upper in FIG. 11) end portions 14a, 14b disposed against



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the respective interior side 2b', 2a' of the lower and upper wall parts 2b, 2a and also with its lower (upper in FIG. 11) end 14b' disposed against the ceiling 25. The second arm 16 is fixed to the support 14 in such a position
5 as to contact a downwardly facing surface 2a" of the upper wall part 2a.

At least one of the remaining bent end portions 109b, 110b of the upper horizontal frame member 103, is gripped by at least one clamp 26 connected to the rope 17. The
10 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 upwardly and downwardly through a predetermined angle to wind up the chain 20, the rope 17 and thus the clamp 26 is
15 pulled downwardly together with the upper frame member 103.

As a result, the upper frame member 103 is pulled out from the upper wall part 2a. During that time, because with the second arm 16 as a fulcrum, a falling moment M4 acts on the support 14 due to this pulling force so as to urge the
20 upper (lower in FIG. 11) 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 103 is pulled out from the building wall 2 assuredly.

25 The lower frame member 106 is pulled out from the building wall 2 in the same manner as the upper frame member 105 is.

5 In either of the embodiment of FIGS. 1 through 6 and
the embodiment of FIGS. 7 through 11, since one pair of the
confronting frame members of the outer frame is removed or
pulled out from the window opening after the other pair of
the confronting frame members has been completely removed
from the window opening, each pair of the confropnting
frame members can be removed easily and speedily without
obstruction by each other pair, thus requiring no special
pull-out tool in addition to the ordinary pulling
10 apparatus.

Another advantage of the present method is that since
one pair of the confronting members of the outer frame is
cut at their opposite end portions that have been bent by
pulling the other pair of the confronting frame members
15 inwardly of the window opening, this cutting can be
performed expeditiously not only without being obstructed
by the building wall arround the window opening, but also
without damaging any part of the building wall.

Further, as is clearly seen from FIGS. 6 and 11,
20 because each of the confronting frame members of one pair
to be removed subsequent to those of the other pair is
raised at their bent end portions from the building wall,
it is possible to grip such bent end portions speedily and
stably, facilitating the pulling-out of the frame members.

25 Although various minor modifications may be suggested
by those versed in the art, it should be understood that I
wish to embody within the scope of the patent warranted

hereon, all such embodiments as reasonably and properly come within the scope of this contribution to the art.

Reference is directed to our co-pending application No. 83**24469** (230P46751) of even date herewith.

CLAIMS:-



1. A method of removing a rectangular outer frame of a sash window from a window opening in a building wall, the rectangular outer frame being composed of a pair of confronting first frame members and a pair of confronting second frame members joined with the first frame members at their ends, each of said second frame members being bendable at its opposite end portions, said method comprising the steps of:

(a) pulling the first frame members of the outer frame inwardly of the window opening until each of the second frame members is bent at its opposite end portions;

(b) cutting each of the opposite bent end portions of each second frame member so as to separate an endmost section of each bent end portion from the respective second frame member;

(c) then removing the first frame members from the window opening, each together with the two endmost sections of the second frame members which portions are contiguous to the respective first frame member; and

(d) finally removing the second frame members one after another from the building wall by pulling at least one of the remaining bent end portions of the respective second frame member inwardly of the window opening.

2. A method according to claim 1 which comprises the steps of:



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pulling a pair of upper and lower members of the outer frame inwardly of the window opening until a pair of side jambs of the outer frame is inwardly bent at their upper and lower end portions; cutting each of the bent
5 end portions centrally thereof; then removing the upper and lower members from the window opening, each together with two endmost portions of the side jambs which portions are contiguous to a respective one of the upper and lower frame members, and finally removing
10 the side jambs one after another from the building wall by pulling at least one of the remaining bent portions of the respective side jamb inwardly of the window opening.

3. A method according to claim 1 wherein
15 two side jambs are firstly pulled until the upper and lower frame members are bent at their end portions, and then upper and lower frame members are cut at each of the bent end portions; after the side jambs are removed from the window opening, the upper and lower
20 frame members are removed one after another from the building wall by pulling at least one of the remaining bent end portions of a respective one of the upper and lower frame members.
