

**TITLE: DEVICE FOR TEMPORARILY POSITIONING A FRAME TO
BE CONNECTED SECURELY TO A CONCRETE WALL
DURING CONSTRUCTION OF THE CONCRETE WALL**

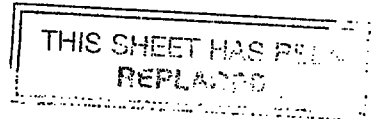
The invention relates to a positioning device, more
5 particularly to a positioning device which is used to
position a frame in a wall form assembly during pouring
of concrete to form a concrete wall.

Usually, when constructing concrete structures,
such as houses and the like, a large amount of time and
10 manpower is wasted on the nailing of wooden panels to
assemble mold forms prior to pouring of concrete and on
the disassembly of the mold forms when the concrete
hardens. Recent advancement in the field of
construction has resulted in the development of
15 reusable unitary or modular wall form assemblies which
permit fast and efficient construction of concrete
structures at a lower manpower requirement.

Prior to pouring of concrete into the mold form
assembly to form the concrete wall, partition plates,
20 which are interconnected to define an opening
therethrough, are positioned within the mold form
assembly. After concrete has been poured and the
concrete wall hardens, the partition plates and the
mold form assembly can be disassembled and removed from
25 the concrete wall, thereby forming the opening which
has a size that is generally larger than the frame to
be fixed therein. Attachment of the window or door

This Sheet Has Been Replaced





frame to the opening of the concrete wall unavoidably involves a plurality of processes, such as drilling of holes in the concrete wall, fixing the frame by means of locking bolts and patching of gaps that are formed between the frame and the concrete wall by cement and the like. This results in extra cost and in a waste of manpower.

The main object of this invention is to provide a positioning device, whereby a frame can be temporarily positioned when pouring concrete to form a concrete structure in such a manner that the frame is connected securely to the concrete wall of the structure after the latter hardens.

Another object of this invention is to provide a positioning device which can be reused so that the costs incurred in constructing concrete structure is consequently reduced.

According to this invention, a positioning device is used to position a frame between two parallel form panels of a wall form assembly during the pouring of concrete. The positioning device includes a positioning plate which is adapted to be fastened to one of the form panels and which has a planar positioning surface that abuts against the frame, and two seal strips adapted to be located on two sides of the frame between the form panels in such a manner that each of the seal strips is positioned between the frame

This Sheet Has Been Replaced



and one of the form panels so as to establish a liquid-tight seal between the frame and the form panels. Assembly of the frame and the seal strips defines between the form panels a concrete pouring space and a non-pouring space which are located on two sides of the assembly. The positioning plate is located in the non-pouring space. The frame is positioned between the positioning plate and the concrete pouring space.

After concrete has been poured and the concrete wall hardens, the frame for holding a window or door is attached securely to an inner peripheral portion of the concrete wall that defines an opening. Therefore, when the positioning device of this invention is used to position temporarily the frame during the concrete pour, lots of manpower and expense can be saved. Consequently, the construction period can be shortened.

Other features and advantages of this invention will become more apparent in the following detailed description of the preferred embodiments with reference to the accompanying drawings, in which:

Figure 1 illustrates how a first preferred embodiment of a positioning device of this invention positions a frame between two parallel form panels of a wall form assembly;

Figure 2 is a sectional view of the first preferred embodiment taken along line II-II in Fig. 1;

Figure 3 illustrates how a second preferred



embodiment of this invention positions a frame between two parallel form panels of a wall form assembly;

Figure 4 is a sectional view of the second preferred embodiment taken along line IV-IV in Fig. 3;

5 Figure 5 illustrates how a third preferred embodiment of this invention positions a frame between two parallel form panels of a wall form assembly;

Figure 6 is a sectional view of the third preferred embodiment taken along line VI-VI in Fig. 5;

10 Figure 7 illustrates how a fourth preferred embodiment of this invention positions a frame between two parallel form panels of a wall form assembly; and

Figure 8 is a sectional view of the fourth preferred embodiment taken along line VIII-VIII in Fig.

15 7.

The positioning device of this invention is used to position a frame between two parallel form panels of a wall form assembly when pouring concrete to form a concrete wall.

20 Referring to Figures 1 and 2, three positioning devices of this invention are used to position a door frame (1) constituted by two vertical portions (1a) and a horizontal portion (1b) which interconnects the vertical portions (1a).

25 Each of the positioning devices is used to position one of the portions (1a) of the door frame (1) between two parallel panels (2, 3) and includes an elongated

This Sheet Has Been Replaced



THIS SHEET HAS BEEN
REPLACED

positioning plate (4) and a pair of elongated seal strips (5) (see Fig. 1). Each of the positioning plates (4) has a mounting portion (41) formed with a plurality of parallel slots (411) (see Fig. 1), and an abutting portion (42) formed integrally with the mounting portion (41). Each of the abutting portions (42) has a planar positioning surface which abuts against the door frame (1) and which is perpendicular to the panels (2, 3). As best shown in Fig. 2, a lock bolt (412) is inserted through the respective slot (411) of the positioning plate (4) and through the form panel (3), and is threaded in a retaining plate (30) so as to lock the positioning plate (4) on the form panel (3). The retaining plate (30) may be replaced with several nuts (not shown). As illustrated, the lock bolts (412) can slide within the slots (411) of the positioning plate (4) in a direction parallel to the form panels (2, 3) so as to adjust position of the positioning plate (4) relative to the form panel (3). The seal strips (5) are made of a flexible material, such as polyurethane, and are disposed on two sides of the frame (1) between the form panels (2, 3). Each of the seal strips (5) includes an L-shaped connecting plate (51) screwed to a respective one of the form panels (2, 3), and an elongated curved seal (52) secured adhesively to the L-shaped connecting plate (51) in such a manner that the curved seal (52) is

This Sheet Has Been Replaced



THIS SHEET HAS BEEN
REPLACED

clamped between the frame (1) and one of the form panels (2, 3) so as to establish a liquid-tight seal between the frame (1) and the form panels (2, 3). Assembly of the frame (1) and the seal strips (5) defines between the form panels (2, 3) a concrete pouring space (23) and a non-pouring space (24) which are located on two sides of the assembly. The positioning plate (4) is located in the non-pouring space (24) in such a manner that the frame (1) is positioned between the positioning plate (4) and the concrete pouring space (23). Thus, after concrete has been poured and the concrete wall hardens, the form panels (2, 3), the positioning plate (4) and the seal strips (5) can be disassembled and removed from the concrete wall such that the frame (1) is connected securely to the inner peripheral portion of the concrete wall (not shown).

A modified preferred embodiment of this invention is shown in Figs. 3 and 4. As illustrated, the seal strips (5", 50") include two L-shaped connecting plates (51", 501") of different sizes which are respectively screwed to the form panels (2, 3) by two lock bolts (510", 511"), and two seals (52", 502") of different widths which are respectively adhered to the connecting plates (51", 501") so as to be clamped between a window frame (1") and the form panels (2, 3) in order to establish a liquid-tight seal between the frame (1")

This Sheet Has Been Replaced



and the form panels (2, 3). Thus, as illustrated in Fig. 4, a concrete pouring space (23") and a non-pouring space (24") are defined on two sides of the assembly constituted by the frame (1") and the seal strips (5", 50").

Referring to Figs. 5 and 6, in another preferred embodiment, a positioning plate (4a) has an abutting portion (42a) with a planar positioning surface which abuts against a door frame (1c), and a mounting portion (41a) which is formed integrally with the abutting portion (42a) and which is attached to a plurality of T-shaped coupling blocks (43) (see Fig. 5) by means of small bolts (431a). Each of the coupling blocks (43a) has a protruding middle portion (432a) that is fastened to the form panel (2) by means of a large bolt (44a). The seal strips (5a) are made from ethyl vinyl acetate and are connected adhesively to the form panels (2, 3). Thus, a concrete pouring space (23a) and a non-pouring space (24a) are formed between the form panels (2, 3) and are located on two sides of the assembly constituted by the door frame (1c) and the seal strips (5a).

Figs. 7 and 8 show another embodiment of this invention. As illustrated, four positioning devices are used to position temporarily a window frame (10) in the wall form assembly. Unlike the previous embodiments, each of the positioning devices further



THIS SHEET HAS BEEN
REPLACED

includes a plurality of T-shaped coupling blocks (7, 7'), and a plurality of elongated strip holders (8, 8') (see Fig. 8). Each of the right coupling block (7') has a threaded hole (710') formed therethrough and fastened to the form panel (3) by a right bolt (32) which extends through the form panel (3) and one of the right strip holders (8') to engage the right portion of the threaded hole (710') of the right block (7'). Each of the left blocks (7) has a recess (711) communicated with a through hole (712) formed therethrough and disposed on one side of the mounting portion (62) of each of the positioning plates (6) such that the abutting face (70) of the left block (7) abuts against the mounting portion (62). Each of the left blocks (7) is fastened to the corresponding right block (7') by a left bolt (72) which extends through the through-hole (712) of the left block (7), and through the mounting portion (62) and is threaded in the left portion of the threaded hole (710'), thereby securing the blocks (7, 7') on the form panel (3). The left strip holders (8) is bolted to the left block (7). Each of the left and right strip holders (8, 8') has a fixed jaw (81, 81'), a movable jaw (82, 82') mounted movably on the fixed jaw (81, 81'), and a small adjustment bolt (810, 810') actuatable to move the movable jaw (82, 82') relative to the fixed jaw (81, 81') so as to define a dovetail groove (811, 811')

This Sheet Has Been Replaced

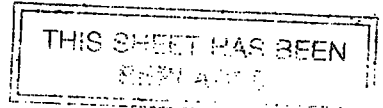


between the fixed and movable jaws (81, 81', 82, 82'). The seal strips (9, 9') are located on two sides of the frame (10) between the form panels (2, 3). Each of the seal strips (9, 9') has an integral dovetail tongue (91, 91') engaged within a corresponding one of the dovetail grooves (811, 811') of the strip holders (8, 8') so as to establish a liquid-tight seal between the window frame 10 and the form panels (2, 3). Assembly of the window frame (10) and the seal strips (9, 9') defines between the form panels (2, 3) a concrete pouring space (23b) and a non-pouring space (24b) which are located on two sides of the assembly. As illustrated, the positioning plate (6) is located in the non-pouring space (24b).

The positioning plate (6) has an L-shaped portion (63) formed with a threaded-hole therethrough, and a large adjustment bolt (64) which extends through the threaded-hole of the L-shaped portion (63) to press against the right coupling block (7'), thereby permitting movement of the positioning plate (6) relative to the form panels (2, 3) in a direction parallel to the form panels (2, 3). Thus, adjustments to the position of the frame (10) can be performed when the locking bolt (32) and the threaded nut (641) are released.

After concrete has been poured and the concrete wall hardens, the wall form assembly and the





positioning device of this invention are disassembled
and removed from the concrete wall. The frame is
attached securely to an inner peripheral portion of the
concrete wall that defines an opening for mounting a
5 door or window therein. Therefore, lots of manpower
and expense can be saved and consequently, the
construction period can be shortened.

This Sheet Has Been Replaced



THIS SHEET HAS BEEN
REPLACED

CLAIMS:

1. A positioning device for positioning a frame between two parallel form panels of a wall form assembly when pouring concrete, the device comprising:

5 a positioning plate adapted to be fastened to one of the form panels and having a planar positioning surface which abuts against the frame and which is adapted to be perpendicular to the form panels;

10 two seal strips adapted to be located on two sides of the frame between the form panels in such a manner that each of the strips is positioned between the frame and one of the form panels so as to establish a liquid-tight seal between the frame and the form panels, assembly of the frame and the seal strips defining
15 between the form panels a concrete pouring space and a non-pouring space which are located on two sides of the assembly, the positioning plate being located in the non-pouring space in such a manner that the frame is positioned between the positioning plate and the
20 concrete pouring space, whereby concrete is to be poured into the concrete pouring space.

2. A positioning device as claimed in Claim 1, wherein the positioning plate includes a slot formed therethrough, and a lock bolt extending through the
25 slot of the positioning plate so as to lock the positioning plate on the one of the form panels, the lock bolt being capable of being loosened from the one



This Sheet Has Been Replaced



of the form panels in order to move in the slot of the positioning plate so as to move the positioning plate between the form panels in a direction parallel to the form panels.

5 3. A positioning device as claimed in Claim 1, wherein the seal strips are made of a flexible material.

4. A positioning device as claimed in Claim 1, wherein the seal strips are adapted to be secured respectively to the form panels.

10 5. A positioning device as claimed in Claim 4, further comprising two connecting plates which are adapted to be screwed to a respective one of the form panels and which are secured respectively to the seal strips.

15 6. A positioning device as claimed in Claim 1, wherein the seal strips are connected securely to the positioning plate.

7. A positioning device for positioning a frame between two parallel form panels of a wall form assembly when pouring concrete, the device comprising:

20 a positioning plate adapted to be fastened to one of the form panels and having a planar positioning surface which abuts against the frame and which is adapted to be perpendicular to the form panels;

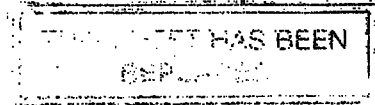
 two strip holders, each of which has a dovetail
25 groove formed therein;

 two coupling blocks respectively and securely connecting the strip holders to the positioning plate;



This Sheet Has Been Replaced





and

two seal strips adapted to be located on two sides of the frame between the form panels in such a manner that each of the strips is positioned between the frame and one of the form panels so as to establish a liquid-tight seal between the frame and the form panels, each of the seal strips having an integral dovetail tongue engaged within a corresponding one of the dovetail grooves of the strip holders, assembly of the frame and the seal strips defining between the form panels a concrete pouring space and a non-pouring space which are located on two sides of the assembly, the positioning plate being located in the non-pouring space, whereby concrete is to be poured into the concrete pouring space.

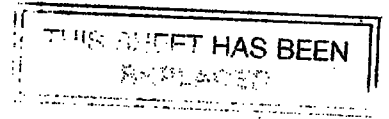
8. A positioning device as claimed in Claim 7, wherein each of the strip holders includes a fixed jaw connected securely to the positioning plate, a movable jaw mounted movably on the fixed jaw, and a small adjustment bolt interconnecting the fixed jaw and the movable jaw and being actuatable to move the movable jaw relative to the fixed jaw so as to define the dovetail groove between the fixed and movable jaws, and so as to clamp a corresponding one of the seal strips between the fixed jaw and the movable jaw.

9. A positioning device as claimed in Claim 7, wherein the positioning plate has an L-shaped portion with a



This Sheet Has Been Replaced





5 threaded hole formed therethrough, and a large adjustment bolt which extends through the hole of the positioning plate to press against one of the coupling blocks, the large adjustment bolt being adjustable to move the positioning plate relative to the form panels in a direction parallel to the form panels.

10. A positioning device substantially as described hereinbefore with reference to and as illustrated in Figs. 1 to 8 of the accompanying drawings.

10



This Sheet Has Been Replaced

