

(21) Application No 9004251.6

(22) Date of filing 26.02.1990

(71) Applicant  
**C.V. Buchan (Concrete) Limited**  
  
(Incorporated in the United Kingdom)  
  
Sandway House, Hartford, Northwich, Cheshire,  
CW8 2YA, United Kingdom

(72) Inventors  
**William Jack Walmsley**  
**Christopher Richard Smith**

(74) Agent and/or Address for Service  
**Raworth Moss and Cook**  
36 Sydenham Road, Croydon, Surrey, CR0 2EF,  
United Kingdom

(51) INT CL<sup>5</sup>  
B28B 7/00

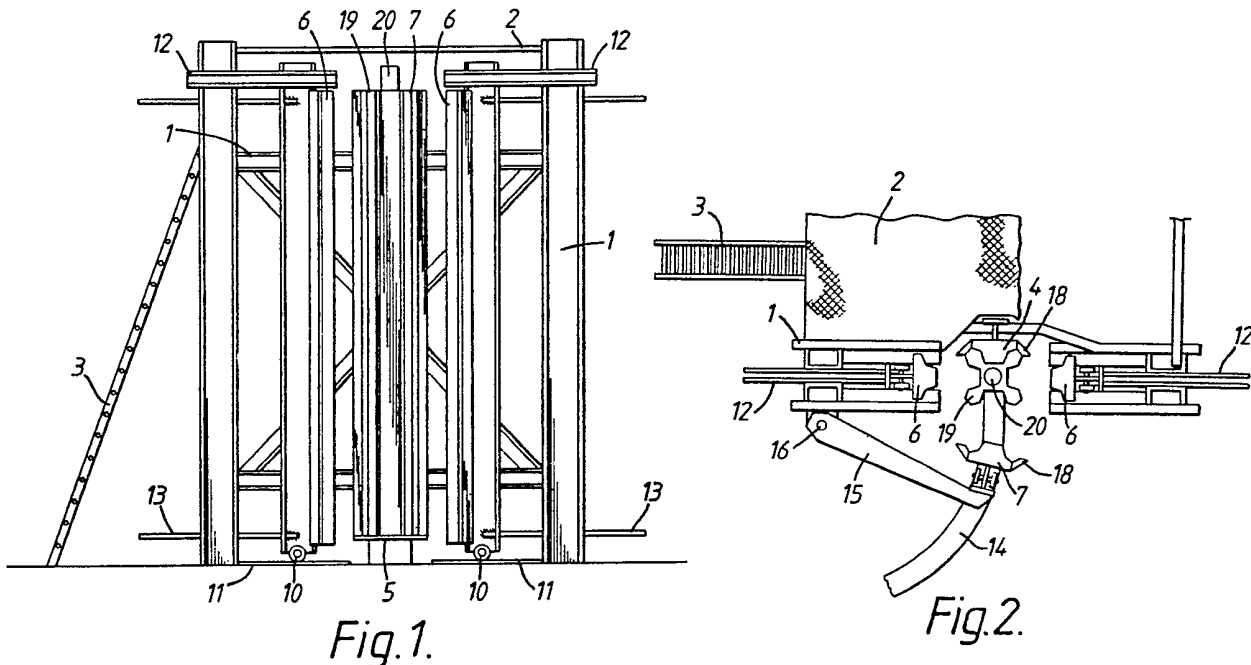
(52) UK CL (Edition K)  
B5A AM4 AT3P A1R150 A1R214A A1R413 A1R455  
A2E1B A2E11 A2E12C A2E9 A20T3

(56) Documents cited  
GB 2095165 A GB 2072082 A GB 1477827 A  
GB 1410968 A GB 1140093 A GB 1075442 A  
GB 0245465 A

(58) Field of search  
UK CL (Edition K) B5A AMC AM4 AT3P  
INT CL<sup>5</sup> B28B

(54) Apparatus and method for moulding concrete

(57) An apparatus for moulding within tight tolerances and accurate repeatability a series of substantially identical, profiled concrete columns comprises a support structure (1) with an upper working platform (2). A rigid master reference moulding member (4) is rigidly secured to this support structure and three rigid, moveable, complementary moulding members (6) and (7) with identical shapes to the fixed moulding member (4) are guidedly moveable on the support structure between a first position where they are adjacent each other and the fixed moulding member and the members present internal faces (17) which define between them the shape of the column to be moulded and a second position where the concrete column so moulded can be released.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

1/2

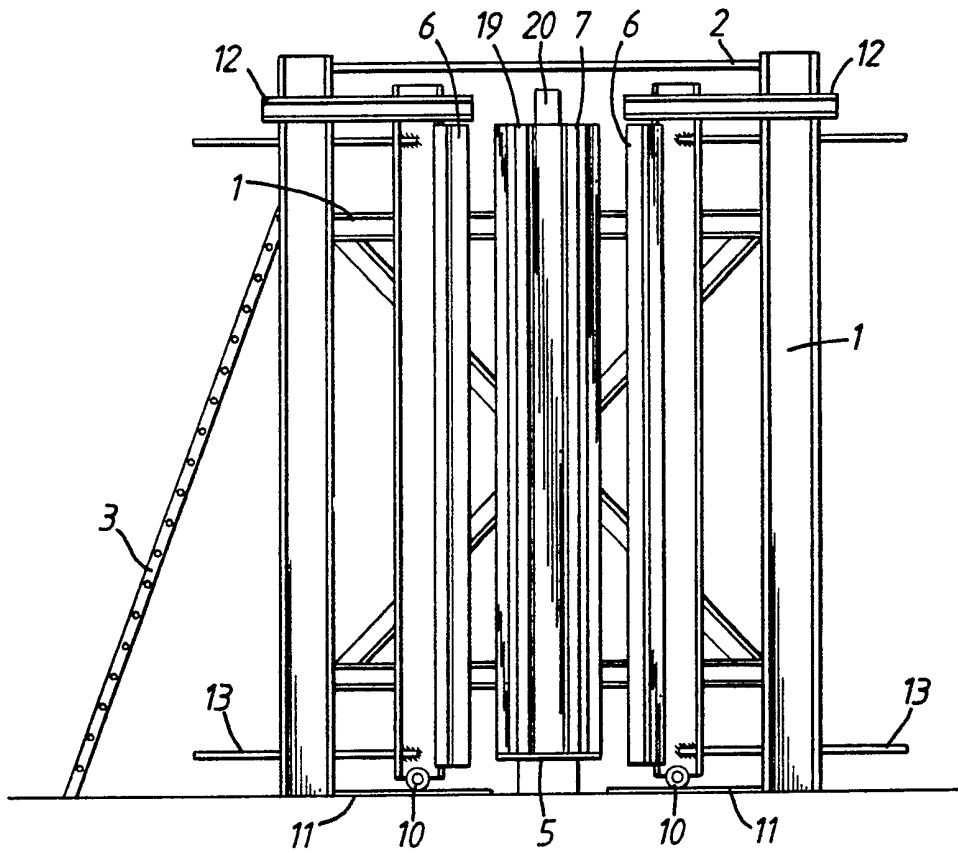


Fig. 1.

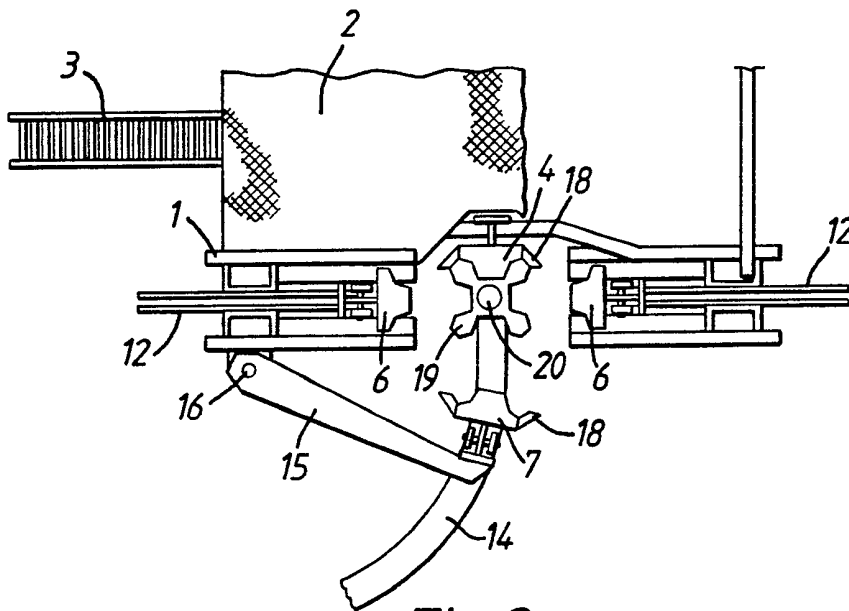


Fig. 2.

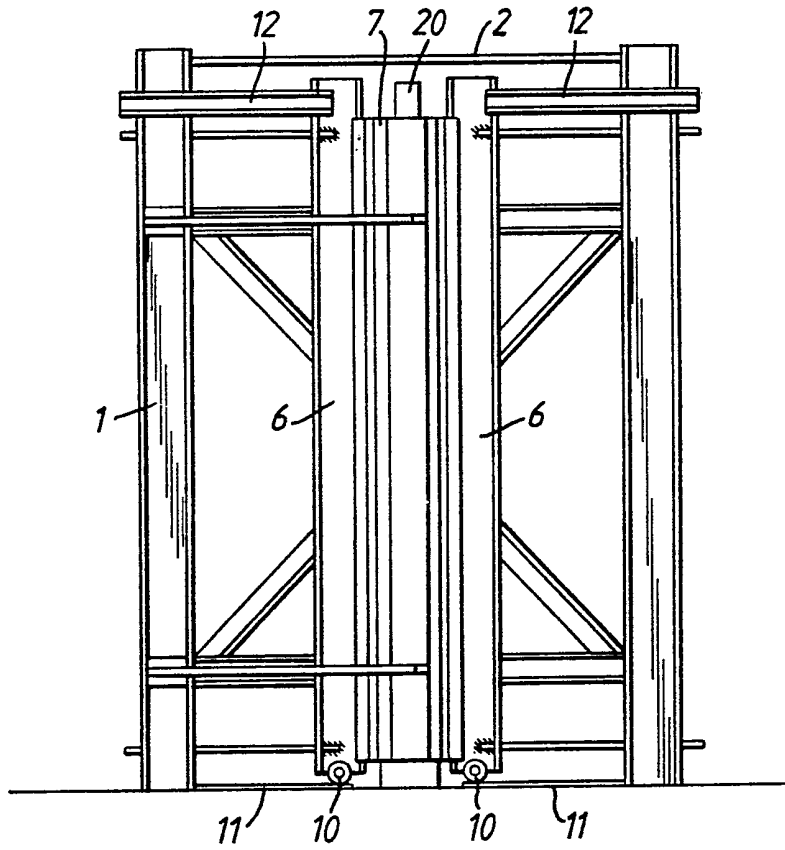


Fig. 3.

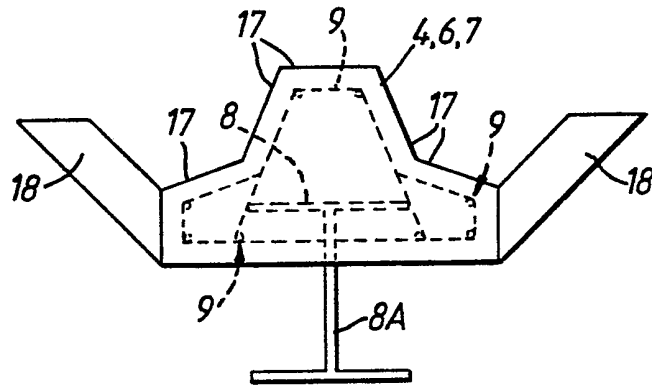


Fig. 4.

APPARATUS AND METHOD FOR MOULDING CONCRETE

This invention relates to an apparatus and a method for moulding concrete.

5

According to one aspect of the present invention, there is provided an apparatus for moulding within tight tolerances and accurate repeatability a series of substantially identical, profiled concrete columns, comprising a support structure supporting a fixed, master reference moulding member of rigid material and a plurality of moveable, complementary moulding members of rigid material, which are guidedly moveable on said support structure between a first position where they are adjacent each other and the fixed moulding member and the members present internal faces which define between them the shape of the column to be moulded, and a second position where the concrete column so moulded can be released, there being shuttering for performing a sealing function between the members.

20

According to another aspect of the present invention, there is provided a method of moulding a series of substantially identical, profiled concrete columns using an apparatus which is essentially as defined in the preceding paragraph.

25

The moulding members may themselves be made of concrete and preferably incorporate reinforcement. The reinforcement can take the form of steel wires and each member can be supported by a heavy steel section incorporated in it and extending from it for attachment to part of said structure.

30

Means are provided to ensure that the fixed, master reference moulding member is accurately aligned relatively to the support structure and to the moveable moulding members. The moveable moulding members can be mounted on tracks with mechanism provided to reciprocate them between their first and second positions. At least one of the moveable moulding members can be supported by said structure from a swinging arm which thereby causes that moveable member to move in an arc between said first and second positions.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:-

Figure 1 is a diagrammatic side view of an apparatus for moulding a series of substantially identical, profiled concrete columns, the apparatus being shown in a mould-release condition,

Figure 2 is a plan view of the apparatus of Figure 1 in its mould-release condition,

Figure 3 is a side view similar to Figure 1 but showing the apparatus in a condition ready for receiving concrete to mould a column, and

Figure 4 is an enlarged view showing a moulding member detail.

Referring to the drawings, the apparatus is intended to produce a series of substantially identical, profiled

concrete columns in precast units requiring a high standard of finish or an architectural finish on all sides.

5 The apparatus stands on the ground and includes a support framework or structure 1 with an upper working platform 2 for the operatives, to which platform access can be gained via a ladder 3.

10 The support structure 1 is rigid and a rigid master reference moulding member 4 is rigidly secured to the support structure. This master reference moulding member 4 is very accurately aligned to a machined base table 5 and is held precisely in the required position along its  
15 length by the support structure 1.

In the embodiment illustrated, there are also three rigid, moveable, complementary moulding members 6 and 7, which each have an identical shape to the fixed moulding  
20 member 4. They are all of concrete and comprise an integral heavy steel section 8 (rolled steel joist section) of which part of the web and one flange 8A extends outside the concrete of the moulding member for securing the moulding member to the support structure 1.  
25 The moulding members are also reinforced with steel wires 9 which both form a cage and extend longitudinally of the moulding members. Both the rigid material and the heavy steel section serve to provide good rigidity over the full height of the mould thereby to ensure a high degree  
30 of accuracy.

The moulding members 6 are mounted on wheels 10 which run on respective tracks 11 on the ground and they are also guided at their upper ends by respective guides 12 forming part of the support structure 1. It will therefore be seen from the drawings that the moveable moulding members 6 are able to be reciprocated along the tracks from a first position where they both lie adjacent the fixed moulding member 4 (Figure 3) and a second position (Figures 1 and 2) which is remote from the first position. A push-pull mechanism, shown diagrammatically at 13, is provided for each moulding member 6 to move it between its first and second positions. The movement of the two moulding members 6 can be synchronised if required.

The moveable moulding member 7 is also mounted on wheels (not shown) on an arcuate track 14 on the ground and is supported by a swing arm 15 pivoted at its inner end 16 to the support structure 1. In fact, two swing arms 15 are provided, one for supporting the upper end of the moulding members 7 and the other for supporting the lower end of the moulding member 7. Swing arms 15 have been omitted from Figure 1 for clarity.

Each concrete moulding member 4, 6 and 7 can be made from a single master breeding mould and it is the inner faces, referenced 17 in Figure 4, of the moulding members which are the critical faces for obtaining the accuracy in shape and dimensions required in the finished concrete column to ensure a tight, sealing fit against the adjacent moulding members when they are moved to their first positions. Shuttering 18 is bolted to the moulding

members. This shuttering can be edged with a sponge rubber seal to seal the vertical splits when the shutters are offered against one another.

5 A typical profiled concrete column to be made by the apparatus is illustrated by the reference numeral 19. To make the column, a central steel tubular support boss 20 surrounded by a reinforcement wire cage is jugged into position and is provided with a protective upper cap (not  
10 shown) to prevent concrete from entering the tube. The moveable moulding members 6 are then shifted to their first positions and the moveable moulding member 7 is swung into its first position, whereby the moulding members lie adjacent one another and their internal faces  
15 17 define between them the external, longitudinal shape of the column 19 to be moulded. Concrete is then poured in from the top and vibrated and is allowed to cure for some twenty four hours.

20 When the concrete has set, the moulding member 7 is swung out of its first position and the moulding members 6 are slid along the tracks away from one another. The protective cap is lifted off the central steel boss 20 and, using lifting gear, the moulded concrete column,  
25 with all four sides accurately profiled, is lifted clear of the apparatus. A fresh steel tubular boss 20 is then jugged into position ready to make another column.

30 It will be appreciated that the present apparatus and method enables long thin concrete units to be cast which require a high standard of finish and the dimensions of the unit are accurately controlled by the rigidity of the



supporting structure and the moulding members. The moulding members ensure tight tolerances by the use of concrete faces steel sections which comprise the moulding members.

5

The moulding members themselves can be accurately reproduced because they are themselves cast in concrete from a single master which ensures accuracy and repeatability of a section.

10

By virtue of the swinging arm moulding member 7 and the sliding moulding members 6, it will be appreciated that the concrete column cast between the members can be easily stripped from the mould once set.

15

The various shapes of the moulding members can, of course, be varied to suit the required shapes of the finished columns.

20

The supporting structure can be arranged so that may be as many as twenty, for example, columns can be cast alongside one another in a single casting cycle.

25

30

CLAIMS:

- 5 1. An apparatus for moulding within tight tolerances and accurate repeatability a series of substantially identical, profiled concrete columns, comprising a support structure supporting a fixed, master reference moulding member of rigid material and a plurality of moveable, complementary moulding members of rigid material, which are guidedly moveable on said support structure between a first position where they are adjacent each other and the fixed moulding member and the members present internal faces which define between them the shape of the column to be moulded, and a second position where the concrete column so moulded can be released, there being shuttering for performing a sealing function between the members.  
10
- 15 2. An apparatus according to claim 1, in which said moulding members are made of concrete.  
20
3. An apparatus according to claim 1 or 2, wherein said moulding members incorporate reinforcement.
- 25 4. An apparatus according to claim 3, wherein the reinforcement is in the form of steel wires.
- 30 5. An apparatus according to any one of the preceding claims, wherein each moulding member is supported by a heavy steel section incorporated in it and extending from it, being attached to part of said structure.

6. An apparatus according to any one of the preceding claims, wherein said moveable moulding members are mounted on wheels which run on respective tracks.

5 7. An apparatus according to any one of the preceding claims and comprising a push-pull mechanism to move said moveable moulding members.

10 8. An apparatus according to any one of the preceding claims and comprising swing arms supporting said moveable moulding members.

15 9. An apparatus for moulding a series of substantially identical, profiled concrete columns, substantially as hereinbefore described with reference to the accompanying drawings.

20 10. A method of moulding a series of substantially identical, profiled concrete columns using an apparatus according to any one of the preceding claims.

25

30