

MODULAR MOULD FOR BATCH MOULDING OF CONCRETE OR CEMENTITIOUS PRODUCTS

BACKGROUND TO THE INVENTION

5 The invention relates to a mould for moulding the desired articles, typically building blocks composing of mixtures with concrete or cementitious products. Building blocks composing of mixtures with concrete or cementitious products are conventionally moulded in a mould with mould cavities orientated horizontally which is not economical in terms of space requirements. The mould typically comprises a pair of
10 opposing longitudinal side walls that are connected by a pair opposing lateral side walls at their ends to form a perimeter wall locating on top and connected to a base plate to form an enclosed space with an open top face. The mould components are typically connected using fasteners. The enclosed space is partitioned by a plurality of divider plates, held upright in position by guiding slots on the inner face of the longitudinal side
15 walls resulting in a plurality of cavities with open top surfaces. After the mould components are securely assembled to form the mould assembly concrete mixtures are poured in to fill the plurality of cavities and with the top exposed surfaces leveled off by an operator using a hand tool to remove any excess concrete mixture from the mould. After the moulded articles are set the mould components are dismantled in order to
20 retrieve the moulded articles. This method of moulding, using the conventional mould inherits with it certain problems as regard to consistency and accuracy of the cross-sectional dimensions and especially the top exposed surface of the moulded article due to shrinking during the setting process.

 Additionally the cycle time for moulding of each batch of articles is excessive as
25 the mould components need to be fully dismantled to extract the moulded articles of the present cycle and subsequently reassembled for moulding the next batch of articles of the next cycle.

 It is the object of the present invention to forward a mould that can ensure consistency and dimensional accuracy of the important surfaces of the moulded article.

30 It is a further objective of the present invention to forward a mould that can substantially reduce the cycle time in moulding and extracting the moulded articles and getting ready said mould for the next cycle for moulding.

It is still a further objective of the present invention to forward a mould that is modular in construction, relative light in weight and cost effective in terms of space requirement.

5 SUMMARY OF THE INVENTION

A mould comprises main components namely a plurality pairs of end divider columns, a plurality of center divider columns, a pair of end divider plates and a plurality of divider plates detachably connected by a plurality of tie bolts and locking nuts to form an integral unit having a plurality of segments, arranged along the longitudinal axis of said mould with each said segment having an array of upright cavities for batch moulding of the desired articles, typically concrete products and building materials, composing of mixtures with concrete or cementitious products. A lifting means that comprises appropriately positioned through holes on the end divider columns, lifting bars and lifting frames for lifting the mould off the ground in order to retrieve the moulded articles is provided.

The end divider column comprises a left end strip and a right end strip of substantially similar width and height, positioned spaced apart and locating at substantially parallel planes and positioned within and connected to an opposite positioned inner strip and an outer strip to form an integral unit. On the left end strip is a pair of spaced apart first slots, one located towards the upper end and another located towards the lower end with said first slots characterized by having semi-circular ends with the diameter of the semi-circle at the lower end greater in dimension than the diameter of the semi-circle at the upper end and with their axes substantially parallel to one another and inclined inwardly with reference to the vertical axis of the end divider column. On the right end strip is a pair of spaced apart second slots with one located towards the upper end and the other located towards the lower end. The second slots are characterized by having semi-circular ends and with their axes substantially parallel to one another and inclined inwardly with reference to the vertical axis of the end divider column. The locations of the pair of first slots on the left end strip and the pair of second slots on the right end strip are such that the centers of their upper semi-circular ends locate coaxially and with the longitudinal axes of said first slots and said second slots substantially parallel to one another.

The center divider column comprises a left center strip and a right center strip of substantially similar width and height, spaced apart, locating at substantially parallel

planes and with said left center strip and said right center strip positioned within and connected to opposing center side plates to form an integral unit. Additionally the width of the center side plate is substantially equal to the width of the inner strip and the width of the outer strip of the end divider column. On the center left strip is a pair of spaced
5 apart slots having semi-circular ends, with one said slot locating towards the upper end and the other slot locating towards the lower end and with the vertical axes of said slots substantially co-linear. On the center right strip is a pair of spaced apart through holes with one said through holes locating towards the upper end and the other through hole locating towards the lower end and with the vertical axes of said through holes
10 substantially co-linear. The center of the upper semi-circular end of the slot on the upper end of the left center strip and the center of the through holes on the upper end of the center right strip are substantially coaxially. Likewise the center of the center of the slot on the lower end of the left center strip and the center of the through hole on the lower end of the center right strip are substantially coaxially. The top of the center divider
15 column is sealed with a plate to prevent concrete mixtures from being lodged within said center divider column during the moulding process. An indicative means is present to assist the operator to correctly orientate the center divider columns when the mould is being assembled.

The divider plate comprises a substantially flat rectangular plate of defined
20 dimensions having three pairs of suitably positioned spaced apart through holes, each suitably sized for locating a tie bolt, with each pair orientated coaxially along an upright axis and with a pair each located towards the opposing ends of the divider plate and the third pair locating in between.

The end divider plate comprises a substantially flat rectangular plate of defined
25 dimensions having three pairs of suitably positioned spaced apart through holes and a reinforcement means for stiffening said end divider plate with the size and the relative positions of the spaced apart through holes on the end divider plate substantially similar to the through holes on the divider plate.

Tie bolts of a specific length and diameter and locking nuts are used to
30 detachably connect the main components to form an integral unit of the mould.

The mould is assembled by detachably connecting and securing the end divider plates, end divider columns, center divider columns and divider plates together with tie bolts and locking nuts. At each end of the mould is positioned an end divider plate with said end divider plates orientated to mirror one another. In between the end divider

plates are arranged in sequential order, starting from the first end divider plate, a row having a pair of end divider columns positioned at opposing outer edges and a center divider column position in between said end divider columns followed by a divider plate contacting the forward edges of said pair of end divider columns and said center divider column to form a segment having two cavities for moulding the building blocks. This sequential arrangement is repeated till the desired number of segments or specifically the number of cavities for moulding the building blocks is achieved. At the last segment the second end divider plate substitutes the divider plate. The end divider plates, the end divider columns, the center divider columns and the divider plates in the arranged sequential order as described above rest upright on a flat surface and detachably connected and secured together between the stoppers of the tie bolts and the engaged locking nuts.

Moulding of the desired articles requires careful pouring the mixtures with concrete cementitious products into the cavities of the mould till they are filled to the top and after a predetermined time the mixtures are set in the mould to form the desired articles. The desired moulded articles can then be removed by loosen the locking nuts from the tie bolts and subsequently lifting up the mould by the lifting means. With the mould lifted above ground, the end divider columns swing outwardly about the lifting bars creating clearances within the segments, enabling the mould to clear the moulded articles that remain on the floor and can be subsequently collected.

This is a major advantage over several existing design of moulds as much time is extracted from the mould, said mould can be readied by tightening the locking nuts.

These and other features, advantages and objectives of the present invention will be further understood and appreciated by those skilled in the art by the following specification, appended drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawing constitutes part of this specification and includes an exemplary or preferred embodiment of the invention, which may be embodied in various forms. It should be understood, however, the disclosed preferred embodiments are merely exemplary of the invention. Therefore, the figures (not to scale) disclosed herein are not to be interpreted as limiting, but merely as the basis for the claim and for teaching one skilled in the art of the invention.

Fig. 1 shows the mould of the present invention.

Fig. 1A shows the mould with the nuts disengaged and removed from the tie bolts and with an end divider plate, a row of end dividers and a center divider removed.

Fig. 1B shows the mould with the nuts disengaged and removed from the tie bolts and with an end divider plate, a row of end dividers, a center divider and a divider plate removed.

Fig. 1C shows the top view of the mould.

Fig. 2 shows an isometric view of an end divider of the mould.

Fig. 2A shows the left side of the end divider of the mould.

Fig. 2B shows the front side of the end divider of the mould.

Fig. 2C shows the right side of the end divider of the mould.

Fig. 2D shows the enlarged view of the slotted holes on the left side of the end divider of the mould.

Fig. 2E shows the enlarged view of the slotted holes on the right side of the end divider of the mould.

Fig. 2F shows the top view of the end divider.

Fig. 3 shows an isometric view of a center divider.

Fig. 3A shows the left side of the center divider of the mould.

Fig. 3B shows the front side of the center divider of the mould.

Fig. 3C shows the right side of the center divider of the mould.

Fig. 3D shows the enlarged view of the slotted holes on the left side of the center divider of the mould.

Fig. 3E shows the enlarged view of the slotted holes on the right side of the center divider of the mould.

Fig. 3F shows the top view of the center divider.

Fig. 4 shows an isometric view of an end divider plate.

Fig. 4A shows the front view of the end divider plate.

Fig. 5 shows an isometric view of a divider plate.

Fig. 5A shows the front view of the divider plate.

Fig. 6 shows the tie bolt.

Fig. 6A shows the lifting bar.

Fig. 6B shows the nut for use on the tie bolt.

Fig. 6C shows a tool for working on the nut for the tie bolt.

Fig. 7 shows an isometric view of a lifting frame.

Fig. 7A shows the front view of the lifting frame.

DETAIL DESCRIPTION OF THE INVENTION

The mould (1) of the present invention, as shown in Fig. 1, comprises a combination of main components detachably connected to form an integral unit with said mould (1) having a plurality of segments (9), arranged along the longitudinal axis of said mould (1) with each said segment (9) having an array of upright cavities (10) and with said mould (1) for batch moulding of the desired articles, typically building blocks, composing of mixtures with concrete or cementitious products. In the preferred embodiment of the mould (1) the dimensions of each cavity (10), specifically the cross-sectional dimensions and the heights, are substantially similar with the walls of said cavity (10) providing the surfaces to form the faces of the moulded article thus preventing surface shrinkages at said faces. The main components of the mould (1) are a pair of end divider plates (4), a plurality pairs of end divider columns (2), a plurality of center divider columns (3), a plurality of divider plates (4a) and a plurality of tie bolts (6) and locking nuts (8a). Lifting bars (6a) together with lifting frames (7) are provided, as part of the lifting means, for lifting the mould (1) in order to retrieve the moulded articles.

The end divider column (2) comprises a left end strip (21) and a right end strip (22) of substantially similar width and height, positioned spaced apart and locating at substantially parallel planes and enclosed within and connected to an opposite positioned inner strip (23) and an outer strip (23a) to form an integral unit as shown in Fig. 2 to Fig. 2C. The width of the inner strip (23) and the width of the outer strip (23a) are substantially equal. On the left end strip (21) is a through hole (25) towards the top end and a pair of spaced apart first slots (26) with one said first slot (26) locating towards the upper end and the other first slot (26) locating towards the lower end. The first slots (26) are characterized by having their axes substantially parallel to one another on the plane of the left end strip (21) and are inclined inwardly with reference to the vertical axis of the end divider column (2). In the preferred embodiment each of the first slots (26) has semi-circular ends with the diameter of the semi-circle at the lower end greater in dimension than the diameter of the semi-circle at the upper end as shown in Fig. 2A and Fig. 2E. The center of the through hole (25) and the centers of the upper semi-circular ends of the pair of first slots (26) lie along a substantially common upright axis on the plane of the left end strip (21). On the right end strip (22) there is a through hole (25) towards the top end and a pair of spaced apart second slots (26a) with one said

second slot (26a) locating towards the upper end and the another second slot (26a) locating towards the lower end. The second slots (26a) are characterized by having their axes substantially parallel to one another on the plane of the right end strip (22) and inclined inwardly with reference to the vertical axis of the end divider column (2). In the preferred embodiment, as shown in Fig. 2C and Fig. 2D, each of the second slots (26a) has semi-circular ends and with the upper end semi-circle diameter and the lower end semi-circle diameter substantially similar. The center of the through hole (25) and the centers of the upper semi-circular ends of the pair of second slots (26) lie along a substantially common upright axis on the plane of the right end strip (22). The through hole (25) on the left end strip (21) and the through hole (25) on the right end strip (22) are of substantially similar dimension and with their centers substantially co-axially longitudinally. Likewise the locations of the pair of first slots (26) on the left end strip (21) and the locations of the pair of second slots (26a) on the right end strip (22) are such that the corresponding centers of the upper semi-circular ends of said slots (26, 26a) at the upper ends and at the lower ends of corresponding left end strip (21) and corresponding right end strip (22) are substantially coaxially longitudinally.

A cutout (24) is present on the outer strip (23a) and with the lower edge of said cutout (24) below the level of the through holes (25) on the left end strip (21) and on the right end strip (22) of the end divider column (2). A sealing plate (27) is present to seal off the space within the end divider column (2) below the level of the lower edge of the cutout (24) to prevent concrete mixtures from being lodged within said end divider column (2) during the moulding process. An indicative means is present to assist the fabricator to correctly position and orientate the left end strip (21) and the right end strip (22) when the end divider columns (2) is being fabricated. In the preferred embodiment, the left end strip (21) and the right end strip (22) are positioned slightly inward from the adjacent edges of the inner strip (23) and the outer strip (23a) of the end divider column (2) providing for a left gap (28a) and a right gap (28b) with said left gap (28a) wider than said right gap (28b) as indicated in Fig. 2F. The difference in the size of the right gap (28b) and the left gap (28a) provides the fabricator a visual indicative means to correctly position and orientate left end strip (21) and the right end strip (22) when the end divider columns (2) is being fabricated.

The center divider column (3) comprises a left center strip (31) and a right center strip (32) of substantially similar width and height, spaced apart, locating at substantially parallel planes and with said left center strip (31) and said right center strip

(32) enclosed within and connected to opposite positioned center side plates (33) to form an integral unit as shown in Fig. 3, to Fig. 3C and Fig. 3F. Additionally the width of the center side plate (33) is substantially equal to the width of the inner strip (23) and the width of the outer strip (23a) of the end divider column (2). On the center left strip (31) is a pair of spaced apart slots (35) orientated upright, with one said slot (35) locating towards the upper end and the other slot (35) locating towards the lower end. In the preferred embodiment, as shown in Fig. 3A, the slots (35) have semi-circular ends and with the upright axes of said slots (35) substantially co-linear. On the center right strip (32) is a pair of spaced apart through holes (34) with one said through holes (34) locating towards the upper end and the other through hole (34) locating towards the lower end and with the upright axes of said through holes (34) substantially co-linear. The locations of the slot (35) on the upper end of the left center strip (31) and the through holes (34) on the upper end of the center right strip (22) are such that longitudinally the center of the upper semi-circular end of said slot (35) and the center of the through hole (34) are substantially coaxial. Likewise the locations of the slot (35) on the lower end of the left center strip (31) and the through holes (34) on the lower end of the center right strip (22) are such that longitudinally the center of the upper semi-circular end of said slot (35) and the center of the through hole (34) are substantially coaxial.

The top of the center divider column (3) is sealed with a plate (36) to prevent concrete mixtures from being lodged within said center divider column (3) during the moulding process. An indicative means is present to assist the operator to correctly orientate the center divider columns (3) when the mould (1) is being assembled. In the preferred embodiment of the mould (1) the left center strip (31) and the right center strip (32) are positioned slightly inward from the adjacent edges of the center side plates (33) providing for a left gap (38a) and a right gap (38b) with said left gap (38a) narrower than said right gap (38b) as indicated in Fig. 3F. The difference in the size of the right gap (38b) and the left gap (38a) provides the operator a visual indicative means to correctly orientate the center divider columns (3) when the mould (1) is being assembled. In this example for the center divider column (3) to be correctly orientated the left gap (38a), with a narrower gap size, should be in the forward position and the right gap (38b), with a wider gap size, in the rear position.

The divider plate (4a) comprises a substantially flat rectangular plate of defined dimensions having three pairs of spaced apart and suitably positioned through holes

(47) with each pair orientated coaxially along an upright axis on the plane of said divider plate (4a) as shown in Fig. 5 and Fig. 5A. For each pair of through holes (47), one said through hole (47) is located towards the upper end while the other is located towards the lower end of the divider plate (4a). A pair of the through holes (47) each
5 locates towards each of the opposing ends of the divider plate (4a) with the third pair of through holes (47) locating in between. Each of the through holes (47) is sized to enable a tie bolt (6) to locate at.

The end divider plate (4) comprises a substantially flat rectangular plate (41) of defined dimensions having three pairs of spaced apart and suitably positioned through
10 holes (42) and preferably provided with a reinforcement means for stiffening said end divider plate (4). The size and the relative positions of the spaced apart through holes (42) on the end divider plate (4) are substantially similar to the through holes (47) on the divider plate (4a) and for each pair of through holes (42) one said through hole (42) is located towards the upper end while the other is located towards the lower end. In the
15 embodiment as shown in Fig. 4 and Fig. 4A the reinforcement means takes the form of suitably positioned angle bars (43, 44, 44a, 45, 46) attached, typically by welding, onto one face of the plate (41) leaving the other face flat and with the through holes (42) passing through said angle bars (43, 44, 44a, 45, 46) should they be at the locations where said through holes (42) are present.

The tie bolts (6) are used in conjunction with locking nuts (8a) with each said tie
20 bolt (6) comprises a straight rod, of a defined length that is suited for the mould (1), having a handle (61) at one end, an externally threaded section (62) at the opposing end and a stopper (63) fixed in position and close to said handle (61) as shown in Fig. 6. The internal threads of a locking nut (8a) are able to engage cooperatively with the
25 external threads of the threaded section (62) of a tie bolt (6). The diameter of the tie bolt (6) is such that said tie bolt (6) is able to locate at the through holes (47, 42) present on the divider plate (4a) and the end divider plate (4) respectively, the first slot (26) and the second slot (26a) of the end divider column (2) and the through hole (34) and the slot (35) of the center divider column (3). The design of the tie bolts (6) is such that they are
30 able to span over the desired number of segments (9) and the end divider plates (4), satisfactorily securing them together between the stopper (63) and the engaged locking nut (8a) to form the detachably connected mould (1).

The lifting bar (6a), forming part of the lifting means for lifting the mould (1) off the ground, comprises a rod of a defined length and diameter and having a handle

(66) at one end and a hole (67) through its diameter towards the opposite end as shown in Fig. 6A. The hole (67) is for a pin (68) to be positioned at in order to prevent the lifting bar (6a) slipping out from its intended position once said lifting bar (6a) is suitably placed in position in the mould (1). The diameter of the lifting bar (6a) is such that said lifting bar (6a) is able to locate at the through holes (25) towards the upper end of the divider column (2).

The lifting frame (7), as shown in Fig. 7 and Fig. 7A, comprises a length of sectional bar (71) onto which is attached a plurality of spaced apart hooks (72) that extend downwards from said sectional bar (71). The separation distance between adjacent hooks (72) is such that said hooks (72) are able to fit through the slots (24) of the end divider columns (2) to engage onto the lifting bar (6a) located in the assembled mould (1). A pair of lifting frame (7) forms part of the lifting means for lifting the mould (1) off the ground.

The mould (1) is assembled by detachably connecting and securing together the end divider plates (4), end divider columns (2), center divider columns (3) and divider plates (4a) with tie bolts (6) and locking nuts (8a) as shown in Fig. 1. At each end of the mould (1) is positioned upright an end divider plate (4). The end divider plates (4) at both ends of the mould (1) are orientated to mirror one another with the flat faces facing inwardly and the reinforcement in the form of angle bars (43, 44, 44a, 45, 46) facing outwardly. In between the end divider plates (4) are arranged in sequential order, starting from the first end divider plate (4), a row with one unit of the end divider column (2) positioned upright at each of the opposing outer edges of the mould (1) and with the outer strips (23a) of said end divider columns (2) facing outwardly and a center divider column (3) position upright in between said end divider columns (2) followed by a divider plate (4a) positioned upright and contacting the forward edges of said pair of end divider columns (2) and said center divider column (3) to form a segment (9) having two upright cavities (10) for moulding the building blocks as shown in Fig. 1C. This sequential arrangement is repeated till the desired number of segments (9) or specifically the number of cavities (10) for batch moulding the building blocks is achieved as shown in Fig. 1C. At the last segment (9) the divider plate (4a) is substituted by the second end divider plate (4). The end divider plates (4), the end divider columns (2), the center divider columns (3) and the divider plates (4a) in the arranged sequential order as described above are positioned upright and rest on a flat

surface and detachably connected and secured together between the stoppers (63) of the tie bolts (6) and the engaged locking nuts (8a).

In the example of the mould (1), as provided in Fig. 1 and Fig. 1C, fourteen segments (9) with twenty eight cavities (10) are created using fourteen pairs of end divider columns (2), fourteen center divider columns (3) and thirteen divider plates (4a) placed in between a pair of end divider plate (4) and secured by six sets of tie bolts (6) and similar number of locking nuts (8a). Towards the opposing transverse edges of the mould (1) a tie bolt (6) each is positioned at the upper end and at the lower end of the through holes (42) of the end divider plates (4), the first slots (26) at the left end strips (21) and the second slots (26a) at the right end strips (22) of the end divider columns (2) and the through holes (47) at the divider plates (4a). Towards the center of the mould (1) a tie bolt (6) each is positioned at the upper end and at the lower end of the through holes (42) of the end divider plates (4), the slots (35) at the left center strips (31) and the through holes (34) at the right center strips (32) of the center divider columns (3) and the through holes (47) at the divider plates (4a).

In a moulding process moulding oil is initially applied on the flat surface onto which the mould (1) is set to rest. With the components of the mould (1) detachably connected as described above moulding of the building blocks can begin. Moulding of the building blocks requires careful pouring the mixtures with concrete or cementitious products into the cavities (10) of the mould till they are filled to the level of the center divider columns (3) and the divider plates (4a). Excess mixtures are leveled off from the mould (1). A predetermined time is allowed for the mixtures with concrete or cementitious products to set in the mould (1) to form the building blocks before said building blocks can be removed. To remove the moulded building blocks from the mould (1), the mould components need not be dismantled fully and all that is needed is to loosen the locking nuts (8a) from the tie bolts (6) and with said mould (1) subsequently lifted up and away from its resting surface by the lifting means. The lifting means in this embodiment comprises two lifting bars (6a) placed and secured in position at the through holes (25) of the end divider columns (2) that are positioned at opposing outer edges of the mould (1) and two lifting frames (7), one each engaged to a lifting bar (6a) by having the hooks (72) of said lifting frame (7) hooked to said lifting bar (6a) and with said lifting frames (7) lifted at the sectional bars (71) by a lifting device typically a crane or the extended arms of a fork lift. In this manner the mould (1) will be lifted above its resting surface. When the mould (1) is lifted above its resting surface, the end

divider columns (2) swing outwardly about the lifting bars (6a) at the through holes (25) caused by the loosened tie bolts (6) sliding down along the first slots (26) and the second slots (26a) of said end divider columns (2). The progressive outward swing of the end divider columns (2) creates clearances within the cavities (10), enabling the mould (1) to clear the moulded building blocks as said mould (1) is progressively lifted upwards and away from the resting surface. The moulded building blocks remain on the surface and can be subsequently collected after the mould (1) is lifted clear away. It must be noted that the cavities (10) of the mould (1) are orientated upright and hence the moulded building blocks are positioned upright on the floor after said mould (1) is lifted away.

The above describes an embodiment of a mould (1) provided with one row of center divider columns (3). In this embodiment, each segment (9) has two upright cavities (10) for moulding the desired articles. It is obvious that the center divider columns (3) and the relevant tie bolts (6) and locking nuts (8a) for detachably connecting said pair of end divider plates (4), said plurality of divider plates (4a) and said plurality of center divider columns (3) could be omitted from the embodiment described above. For this embodiment without center divider columns (3), only two pairs of spaced apart and suitably positioned through holes (47) on each divider plates (4a) are provided; that is the pair of spaced apart through holes (47) at the centre of each divider plates (4a) is not required and can be omitted from this embodiment. Similarly, each end divider plate (4) only requires two pairs of spaced apart and suitably positioned through holes (42).

Not having to fully dismantle the main components of the mould (1) in order to extract the moulded articles is a major advantage over several existing designs of the moulds. Much time is saved in preparation for the next cycle of moulding, after the first batch of moulding blocks are extracted from the mould (1). All that is required is to position the mould (1) on a flat surface, realign the main components that are still loosely held together by the tie bolts (6) and subsequently retightening the locking nuts (8a) on said tie bolts (6).

It should be noted that for the sake of clarity all the components and parts of the mould (1) may not be shown and marked in the drawings. Additionally the terms as used in this description refer to the items as orientated in the drawings and they may in any various orientations when in use and as such the orientations as illustrated in the drawings are not necessary for operability.

The foregoing description is considered as illustration of the principles of the invention. Furthermore, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and
5 equivalents may be resorted to, falling within the scope of the invention.

CLAIMS

1. A mould (1) for batch moulding of the desired articles, typically concrete products and building materials, composing of mixtures with concrete or cementitious products, said mould (1) comprises :-
- 5 a pair of end divider plates (4) with each said end divider plate (4) comprises a plurality of appropriately positioned through holes (42) at the upper end and at the lower end and with a said end divider plate (4) each positioned upright at the opposing ends of said mould (1) and orientated to mirror one another;
- 10 a plurality pairs of end divider columns (2) positioned upright at opposing longitudinal edges of said mould (1) and orientated to mirror one another, with each said end divider column (2) comprises a left end strip (21) and a right end strip (22) of substantially similar width and height,
- 15 positioned spaced apart and locating at substantially parallel planes and enclosed within and connected to opposite positioned inner strip (23) and outer strip (23a) to form an integral unit and with said left end strip (21) comprising a pair of suitably positioned spaced apart first slots (26), one locating towards the upper end and the other locating towards the lower end of said left end strip (21) with said first slots (26) characterized by
- 20 having their axes substantially parallel and inclined inwardly with reference to the vertical axis of said end divider column (2) and with said right end strip (22) comprising a pair of suitably positioned spaced apart second slots (26a), one locating towards the upper end and the other locating towards the lower end of said right end strip (22) with said
- 25 second slots (26a) characterized by having their axes substantially parallel and inclined inwardly with reference to the vertical axis of said end divider column (2), with said left end strip (21) and said right end strip (22) orientated substantial perpendicular to the longitudinal axis of said mould (1) and with said inner strip (23) and said outer strip (23a)
- 30 orientated substantially parallel to said longitudinal axis of said mould (1) and with said outer strip (23a) facing outwardly of said mould (1);
- a plurality of divider plates (4a) with each said divider plate (4a) comprises a plurality of appropriately positioned through holes (47) substantially

similar in size, number and positioning as the through holes (42) on each said end divider plate (4) and with each said divider plate (4a) positioned upright to separate each pair of said end divider columns (2) that are arranged in between said end divider plates (4);

5 a plurality of tie bolts (6) and locking nuts (8a), with each said tie bolt (6) having a handle (61) at one end, an externally threaded section (62) that can cooperatively engage with a locking nut (8a) at the opposing end and a stopper (63) fixed in position and close to said handle (61) to detachably connect said pair of end divider plates (4) with said plurality pairs of end
10 divider columns (2), and said plurality of divider plates (4a) suitably arranged in between and towards the opposing transverse edges of said mould (1) a tie bolt (6) each is positioned at the upper end and at the lower end of said through holes (42) of said end divider plates (4), said first slots (26) at said left end strips (21) and said second slots (26a) at
15 said right end strips (22) of said end divider columns (2) and said through holes (47) at the divider plates (4a); and

in between said end divider plates (4) are arranged in sequential order, starting from the first end divider plate (4), a row with one unit of each pair of end divider column (2) positioned upright at the opposing longitudinal
20 edges of the mould (1) and with the outer strips (23a) of said end divider columns (2) facing outwardly followed by a divider plate (4a) positioned upright and contacting the forward edges of said pair of end divider columns (2) and said center divider column (3) to form a segment (9) having one upright cavity (10) for moulding the desired articles with the
25 sequential arrangement repeated till the desired number of segments (9) or specifically the number of cavities (10) is achieved and at the last segment (9) the divider plate (4a) is substituted by the second end divider plate (4) and with the end divider plates (4), the plurality of end divider columns (2), and the plurality of divider plates (4a) in the arranged
30 sequential order detachably connected and secured together between the stoppers (63) and the engaged locking nuts (8a) of the plurality of tie bolts (6); and

a lifting means for lifting said mould (1) off the ground.

2. A mould (1) as in claim 1 wherein for the end divider column (2) the end left end strip (21) and the end right end strip (22) are positioned slightly inward from the adjacent edges of the inner strip (23) and the outer strip (23a) providing for a left gap (28a) and a right gap (28b) with said right gap (28b) wider than said left gap (28a).
3. A mould (1) as in claim 1 wherein for the end divider column (2) on the left strip (21) the pair of spaced apart first slots (26) have semi-circular ends with the lower end semi-circle diameter greater in dimension than the upper end semi-circle diameter and on the right strip (22) the pair of spaced apart second slots (26a) have semi-circular ends with the upper end semi-circle diameter and the lower end semi-circle diameter substantially similar.
4. A mould (1) as in claim 1 wherein lifting means for lifting said mould (1) off the ground comprises :-
- a through hole (25) towards the top end of the left strip (21) and a through hole (25) towards the top end of the right strip (22) with said through hole (25) on said left end strip (21) and said through hole (25) on said right end strip (22) located co-axially and of substantially similar dimension;
- a cutout (24) is present on the outer strip (23a) and with the lower edge of said cutout (24) below the level of the through holes (25) on the left end strip (21) and the right end strip (22) and a sealing plate (27) present to seal off the space within the end divider column (2) at a level below the lower edge of the cutout (24);
- a lifting bar (6a) comprises a rod of a defined length and diameter such that said lifting bar (6a) is able to locate at the through holes (25) of the end divider column (2), a handle (66) at one end of said rod and a hole (67) through its diameter towards the opposite end of said rod with said hole (67) for a pin (68) to be positioned at in order to prevent the lifting bar (6a) to slip out from its intended position once said lifting bar (6a) is suitably placed in position in the mould (1);
- a lifting frame (7) comprises a length of sectional bar (71) onto which is attached a plurality of spaced apart hooks (72) that extend downwards from said sectional bar (71) with the separation distance between

adjacent hooks (72) such that said hooks (72) are able to fit through the slots (24) of the end divider columns (2) to engage onto the lifting bar (6a) located in the assembled mould (1).

- 5 5. A mould (1) for batch moulding of the desired articles, typically concrete products and building materials, composing of mixtures with concrete or cementitious products, said mould (1) comprises :-

10 a pair of end divider plates (4) with each said end divider plate (4) comprises a plurality of appropriately positioned through holes (42) at the upper end and at the lower end and with a said end divider plate (4) each positioned upright at the opposing ends of said mould (1) and orientated to mirror one another;

15 a plurality pairs of end divider columns (2) positioned upright at opposing longitudinal edges of said mould (1) and orientated to mirror one another with each said end divider column (2) comprises a left end strip (21) and a right end strip (22) of substantially similar width and height, positioned spaced apart and locating at substantially parallel planes and enclosed within and connected to opposite positioned inner strip (23) and outer strip (23a) to form an integral unit and with said left end strip (21) comprising a pair of suitably positioned spaced apart first slots (26), one locating towards the upper end and the other locating towards the lower end of said left end strip (21) with said first slots (26) characterized by having their axes substantially parallel and inclined inwardly with reference to the vertical axis of said end divider column (2) and with said right end strip (22) comprising a pair of suitably positioned spaced apart second slots (26a), one locating towards the upper end and the other locating towards the lower end of said right end strip (22) with said second slots (26a) characterized by having their axes substantially parallel and inclined inwardly with reference to the vertical axis of said end divider column (2), with said left end strip (21) and said right end strip (22) orientated substantial perpendicular to the longitudinal axis of said mould (1) and with said inner strip (23) and said outer strip (23a) orientated substantially parallel to said longitudinal axis of said mould (1) and with said outer strip (23a) facing outwardly of said mould (1);

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a plurality of divider plates (4a) with each said divider plate (4a) comprises a plurality of appropriately positioned through holes (47) substantially similar in size, number and positioning as the through holes (42) on each said end divider plate (4) and with each said divider plate (4a) positioned upright to separate each pair of said end divider columns (2) that are arranged in between said end divider plates (4);

a plurality of tie bolts (6) and locking nuts (8a), with each said tie bolt (6) having a handle (61) at one end, an externally threaded section (62) that can cooperatively engage with a locking nut (8a) at the opposing end and a stopper (63) fixed in position and close to said handle (61) to detachably connect said pair of end divider plates (4) with said plurality pairs of end divider columns (2) and said plurality of divider plates (4a) suitably arranged in between and towards the opposing transverse edges of said mould (1) a tie bolt (6) each is positioned at the upper end and at the lower end of said through holes (42) of said end divider plates (4), said first slots (26) at said left end strips (21) and said second slots (26a) at said right end strips (22) of said end divider columns (2) and said through holes (47) at the divider plates (4a) and towards the center of said mould (1) a tie bolt (6) each is positioned at the upper end and at the lower end of said through holes (42) of said end divider plates (4), and said through holes (47) at said divider plates (4a);

in between said end divider plates (4) are arranged in sequential order, starting from the first end divider plate (4), a row with one unit of each pair of end divider column (2) positioned upright at the opposing longitudinal edges of the mould (1) and with the outer strips (23a) of said end divider columns (2) facing outwardly and followed by a divider plate (4a) positioned upright and contacting the forward edges of said pair of end divider columns (2) to form a segment (9) having one upright cavities (10) for moulding the desired articles with the sequential arrangement repeated till the desired number of segments (9) or specifically the number of cavities (10) is achieved and at the last segment (9) the divider plate (4a) is substituted by the second end divider plate (4) and with the end divider plates (4), the plurality of end divider columns (2) and the plurality of divider plates (4a) in the arranged sequential order

detachably connected and secured together between the stoppers (63) and the engaged locking nuts (8a) of the plurality of tie bolts (6); and a lifting means for lifting said mould (1) off the ground.

- 5 6. A mould (1) as in claim 5 wherein for the end divider column (2) the end left end strip (21) and the end right end strip (22) are positioned slightly inward from the adjacent edges of the inner strip (23) and the outer strip (23a) providing for a left gap (28a) and a right gap (28b) with said right gap (28b) wider than said left gap (28a).
- 10 7. A mould (1) as in claim 5 wherein for the end divider column (2) on the left strip (21) the pair of spaced apart first slots (26) have semi-circular ends with the lower end semi-circle diameter greater in dimension than the upper end semi-circle diameter and on the right strip (22) the pair of spaced apart second slots
- 15 (26a) have semi-circular ends with the upper end semi-circle diameter and the lower end semi-circle diameter substantially similar.
8. A mould (1) as in claim 5 wherein the top of the center divider column (3) is sealed with a plate (36) to prevent concrete mixtures from being lodged within
- 20 said center divider column (3) during the moulding process.
9. A mould (1) as in claim 5 wherein for the center divider column (3) the left center strip (31) and the right center strip (32) are positioned slightly inward from the adjacent edges of the center side plates (33) providing for a left gap
- 25 (38a) and a right gap (38b) with said right gap (38b) narrower than said left gap (38a)
10. A mould (1) as in claim 5 wherein lifting means for lifting said mould (1) off the ground comprises :-
- 30 a through hole (25) towards the top end of the left strip (21) and a through hole (25) towards the top end of the right strip (22) with said through hole (25) on said left end strip (21) and said through hole (25) on said right end strip (22) located co-axially and of substantially similar dimension;

- 5 a cutout (24) is present on the outer strip (23a) and with the lower edge of said cutout (24) below the level of the through holes (25) on the left end strip (21) and the right end strip (22) and a sealing plate (27) present to seal off the space within the end divider column (2) at a level below the lower edge of the cutout (24);
- 10 a lifting bar (6a) comprises a rod of a defined length and diameter such that said lifting bar (6a) is able to locate at the through holes (25) of the end divider column (2), a handle (66) at one end of said rod and a hole (67) through its diameter towards the opposite end of said rod with said hole (67) for a pin (68) to be positioned at in order to prevent the lifting bar (6a) to slip out from its intended position once said lifting bar (6a) is suitably placed in position in the mould (1);
- 15 a lifting frame (7) comprises a length of sectional bar (71) onto which is attached a plurality of spaced apart hooks (72) that extend downwards from said sectional bar (71) with the separation distance between adjacent hooks (72) such that said hooks (72) are able to fit through the slots (24) of the end divider columns (2) to engage onto the lifting bar (6a) located in the assembled mould (1).