

TITLE OF THE INVENTION**A METHOD AND APPARATUS FOR IMPROVEMENT OF THE
MECHANICAL PROPERTY OF NON-SINTERING BRICK**

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BACKGROUND OF THE INVENTION**a) Technical Field of the Invention**

The present invention generally relates to improvement of non-sintering brick manufacturing processes resulting the product quality compatible to brick of burnt clay or shale commonly used in brickworks and load bearing walls and, more particularly, is concerned with method and apparatus for regulating the natural characteristic of raw aggregate such as soil, accelerating the chemical reaction of magma and consummating the adobe moulding process, thereby strengthen the mechanical property of brick.

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b) Description of the Prior Art

The difference between sintering brick and non-sintering brick is that of its mechanical strength forming processes. The former uses burnt clay or shale as basic material for adobe and hardened through porcelainised of clay substances under high temperature, thereby the aggregates are being nipped into a single solid, thus forms the mechanical strength of the clay brick. However, the mechanical strength of non-sintering brick derives from the implicative snapping power of aggregate performed by the resultant of agglomerant after the complex chemical reactions occur within its body structure. Its aggregate is composed of a group of highly dispersive mineral substances not being burnt clay or shale such as SiO_2 , Al_2O_3 , Fe_2O_3 , TiO_2 , CaO , MgO and Na_2O_3 , etc. mixed with adequate ration of agglomerant, such as lime and cement and compact into shape of adobe under semi-dried condition. The adobe is naturally solidified through a series of complex chemical reactions under ambient temperature and forms an unified solid with mechanical strength which is generally known as non-sintering brick. This has been a principle known and practised for a long time.

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The mechanical strength of non-sintering brick is integrally attributed by two basic skills: (a) the design of ingredient for production of magma, and (b) the method of adobe moulding. More particularly, the designed of ingredient varies of the technical specification defined for specific brick designation which relates to (a) the inorganic matter content of aggregate and its grain composition, (b) chemical characteristic of agglomerant, and (c) moisture content of aggregate mixture. Furthermore, the method of adobe moulding process relates to the mechanical structure of brick includes (a) weight and density; (b) granules distribution, and (c) snapping power of aggregate.

Aggregate consist of inorganic matters, such as sand and gravel of various gain size was simply crushed, screened and mixed with ration of mono-agglomerant, such as lime or otherwise cement and blended for a specific period of time with the existence of water resulting the changes of aggregate's natural characteristic, thereby produces magma for adobe moulding. In the adobe moulding process, unidirectional adobe press powered by 60 tons or 120 tons nominal pressure was adopted. It was motivated by an undulated track-crank transmission system couples with circular mould deck which was usually assembled beneath the adobe mould kits thus activates the ascending and descending movement of the lower mould plates, thereby generating the unidirectional impetus towards the mould cavities upward. The upper mould plates of no dynamic force were facilitated to seal off the mould cavities while the lower mould arms were ascending.

The manufacturing process of non-sintering brick has seen substantially conserve energy and causes neither ecological disturbances nor air pollution to the environment. It is believed to have great potential to substitute the traditional sintering the clay brick so long as the product quality conforms with the practice on brickworks and load bearing walls. In particular, the non-sintering brick should be of : (a) uniform shape with minimal variation of its overall dimension; (b) free from warpage, cracks and voids; (c) compressive strength conform to the technical requirement of specific brick designation; (d) adequate water absorption rate, and (e) free from white crystalline deposit on the surface of brick due to loss of water on exposure to air.

From the technical standpoint, it is perceived that the non-sintering brick making method has still not reached the potential requirement as aforesaid, therefore, a need exists for further improvement in the manufacturing process.

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SUMMARY OF THE INVENTION

The present invention provides an improved non-sintering brick making method and apparatus as well as resulting the effective control of the product's quality to satisfy the potential requirement for brickworks and load bearing walls. The discovery underlying the present invention is the realisation of : (a) regulating the grain composition of raw aggregate, such as soil, and its natural characteristic to satisfy the poly-agglomerant ingredient designed for specific brick designation; (b) rationalising the aggregate mixture's blending time to enhance the electrolytic dissociation, ion exchange and hydration reactions of aggregate mixture, thereby promote the growing gelatinous substances evenly adhere on the surface of aggregate thus establishes the adobe's granule snapping power; (c) feeding of magma into the mould cavities volumetrically for effective control of brick's weight and its water absorption rate, and (d) adopts multistage bi-directional moulding method to consummate the physical structure of adobe thereby strengthen the brick's mechanic property. This discovery was contrary to many suggestions from others that (a) aggregate was simply crushed, screen and mixed with mono-agglomerant; (b) adobe was moulded before the maturity of magma resulting the malformation of agglomeration processes thus weaken the granules' snapping power; (c) magma was scraped and dropped into the mould cavities thorough the shutter located at the pedestal of adobe press' buffer resulting inconsistency of product's weight and density, and (d) adobe was moulded by unidirectional adobe press resulting an un even impetus distribution to mould cavities brimming with magma causes the lower portion of brick density is higher than it upper portion. Brick's quality resulting from the present invention is dramatically higher than those of the prior methods.

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Accordingly, the present invention relates to method and apparatus for quality control of magma production, which include the operative steps to satisfy the ingredient of poly agglomerant designed for specific brick designation by: (a) regulating the inorganic matter content of raw aggregates by adding adequate ration of silica sand; (b) 5 adjusting the grain composition of raw aggregates through preliminary and secondary crushing followed by screening process; (c) regulating the moisture content of aggregates through heat dehumidification process; (d) accelerating the electrolytic dissociation, ion exchange and hydration reaction of aggregates mixture by coercive pug mill and poly-pug mill. The present invention may also include the step of the current flow to moulding of 10 adobe by multistage bi-directional suppression of magma to form an adobe which include: (a) volumetric feeding of magma to the mould cavities; (b) preliminary suppression of magma; (c) air and granules displacement; (d) secondary suppression of magma; (e) conservative suppression of adobe; (f) demoulding of adobe; (g) despatch of adobe, and a resulting of the formation of adobe's primary agglomeration, thereby the 15 secondary agglomeration and post solidification processes can be occurred orderly with the existence of CO_2 and H_2O in the air.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is schematic representation of technological work-flow of non-sintering brick manufacturing process in accordance with the present invention.

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Fig. 2 is a schematic view of the apparatus for regulating the chemical property of raw aggregate in accordance with the ingredient designed for specific brick designation of the present invention.

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Fig. 3 is a perspective view of apparatus for accelerating the chemical reaction of aggregate mixture to promote the growing of hydrated matters for magma in accordance with the present invention;

Fig. 4 is a schematic view of agglomerant's chemical reactions resulting the growing of gelatinous substances thereby establish the mechanical structure of non-sintering brick;

5 Fig. 5 is a schematic view of apparatus for adobe moulding by bi-directional suppression processes in accordance with the present invention.

DETAILED OF THE PRESENT INVENTION

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Referring now to the drawings, and more particularly to Fig. 1, there is shown in schematic form the non-sintering brick manufacturing process and an apparatus for the manufacturing process comprising an aggregate feeding apparatus 10; a silica sand feeding apparatus 12; a first conveyor 14; a second conveyor 16; a preliminary crushing apparatus 20; an aggregate dehumidification apparatus 18; dried aggregate feeding apparatus 22; a second conveyor 24; a first agglomerant feeding apparatus 26; a secondary crushing apparatus 30; a return conveyor 28; a hygrometer 32; a third conveyor 34; a raw material mixing apparatus 36; a second agglomerant feeding apparatus 38; a forth conveyor 40; a aggregate mixture blending apparatus 42; a magma conveyor 44; an air purification apparatus 46; and a adobe moulding apparatus 48.

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The present invention basically relates to (a) magma production and (b) adobe moulding, more particularly illustrated in Fig. 1 for which (a) is accomplished by apparatuses 10 to 46 and (b) by apparatus 48.

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A preferred embodiment of apparatus for magma production is concerning the regulating of raw aggregate's natural characteristic, compounding of aggregate mixture and accelerating the complex chemical reaction of aggregate mixture, in particular, it include: (a) regulating the physical structure and chemical property of raw aggregate; (b) adding of agglomerant to aggregate, such as soil with prescribed quantity according to the ingredient designed for specific brick designation thereby produce the aggregate

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mixture, and (c) accelerating the chemical reactions of aggregate mixture resulting the growing of gelatinous substances and evenly adhere on the surface of the mineral substances thereby produce magma of technical characteristic satisfies the operating mode of adobe moulding processes.

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More particularly, the magma production process is to be integrally accomplished by apparatus 10 to 46 by following steps. Step 1 : Regulating the chemical property of raw aggregate, such as soil by adding silica sand through the silica sand feeding apparatus 12 to the second conveyor 16, where raw aggregate is successively despatched from the first conveyor 14 through the aggregate feeding apparatus 10 if the inorganic matter of aggregate is found not in conformity with the technical requirement prescribed by the ingredient design for specific brick designation; Step 2 : Crumbing the large soil chunk by the preliminary crushing apparatus 20 to satisfy the technical requirement of Step 4 relates to regulating of aggregate's grain composition; Step 3 : Regulating the moisture content of aggregate by removing the excessive water of raw aggregate through the dehumidification apparatus 18 to satisfy the operating mode of adobe moulding process; Step 4 : Regulating the grain composition of aggregate by further crumbing of its mineral particles and screening through the secondary crushing apparatus 30, thereby changes the physical structure of raw aggregate according to technical specification prescribed by the ingredient designed for specific brick designation; Step 5 : Mixing and blending of raw material include raw aggregate and agglomerants by batch which is to be accomplished by the raw material mixing apparatus 36 for which raw materials are to be allocated intermittently by weight according to ration prescribed by ingredient designed for specific brick designation thereby produce the aggregate mixture; Step 6 : Accelerating the complex chemical reaction of aggregate mixture include mainly electrolytic dislocation, ion exchange, ion absorption, hydration and carbonisation which is accomplished by the aggregate mixture blending apparatus 42, thereby produce magma in accordance to the technical specification prescribed by ingredient designed for specific brick designation.

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In magma production process relating to Step 1 for regulating the chemical

property of raw aggregate, such as soil through adding adequate quantity of silica sand to raw aggregate is illustrated in FIG. 2 of schematic form that the aggregate feeding apparatus 10 is consisting of a soil feeding hopper 113 complete with a scarifier 114 and an adjustable flow gate 115 to control the output of raw material for distribution volumetrically. A grid breaker 111 of 30 x 30mm check-holes is fixed on top of a concrete slop trench 112 for crumbing the large chunk of raw aggregate, such as clayey gravel and transmit to the second conveyor 16 by the first conveyor 14 to satisfy the operating mode of the primary crushing apparatus 20. Raw aggregate of large chunk, such as clayey gravel can be crumbed into smaller size when passing through the check-holes of the grid breaker 111 to satisfy the material intake requirement of the primary crushing apparatus 20 and transmit through the first raw aggregate conveyor 14 to mix with the silica sand scattering throughout the transmission belt of the second aggregate conveyor 16. Silica sand is concurrently despatched through a hopper 121 and evenly scattering throughout the second conveyor 16. The sand hopper 121 is of same design of the soil hopper 113 that the scarifier 122 and the adjustable flow gate 123 are respectively facilitated for monitoring the outflow of material volumetrically. Step 2 relates to crumbing the large chunk of raw aggregate by the preliminary crushing apparatus 20 resulting the grain size of aggregate being maintained to an average of (20mm which is advantageous to dehumidification and grain composition regulating process. Following Step 3 of the magma production process relates to regulating of moisture of raw aggregate discharged from the preliminary crushing apparatus 20 is to be successively despatched to the aggregate dehumidification apparatus 18 and tumbled in the heat trundling chamber of specific calorific value with constant tumbling speed thereby excessive water is to be gasified and maintain its water content at a level of 10% or thereabout. Vaporised water generated by the aggregate dehumidification apparatus 18 is to inducted to the air purification apparatus 46 by suction and reformed to water droplet as absorbent for treatment of fluttering-dust generated by the secondary crushing apparatus 30. Further in Step 4 of soil magma production process relates to regulating of raw material's grain composition which is to be accomplished by a secondary crushing apparatus 30 co-ordinated with the first agglomerant feeding apparatus 26, and the return conveyor 28 that dried aggregate discharged from dehumidification apparatus 18 is to be

despatched to the dried soil feeding apparatus 22 and transmitted to the secondary crushing apparatus 30 through the third conveyor 24 for crushing and screening processes. In the course of transmission, lime powder is added volumetrically through the first agglomerant feeding apparatus 26 according to quantity prescribed by ingredient designed for specific brick designation. Aggregate passes through the vibrating sieve positioned beneath the discharging chute of secondary crusher is to be despatched to the raw material mixing apparatus 36 through the fourth conveyor 34. Coarse grain aggregate not passing through the sieve is to be transmitted to the third conveyor 24 through the return conveyor 28 for re-crushing.

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In Step 5 of the magma production process relates to production of aggregate mixture that aggregate of appropriate grain composition despatched by the secondary crushing apparatus 30 is to be intermittently allocated to the raw material mixing apparatus 36 and mix with cement despatched by the second agglomerant feeding apparatus 38 for which quantity of raw material include aggregate and agglomerants are respectively measured by electronic weighing scale according to the pre-set ratio and blended coercively for a specific period of time. Water sprinkle attached to the raw material mixing apparatus 36, may be activated by programmable logic controller according to the signal given by the hygrometer 32 should moisture content of the aggregate mixture is detected lower than the pre-set level. Total timing for Step 5 may be set for adequate duration thereby produce the aggregate mixture with agglomerant evenly scattered among the mineral substances. More particularly illustrated in FIG. 4 designated "M1" a cross section view of aggregate mixture consist of poly-agglomerants include lime (CaO) and cement resulting the electrolytic dissociation and ionic hydration reactions with the existence of H_2O thereby release considerable amount of cation such as Ca^{2+} , K^+ , Na^+ which are evenly absorbed on the edge, surface and ridge of the inorganic substance by its own negativity thus changes the aggregate's electrified phenomenon. Step 6 relates to accelerating of aggregate mixture's chemical reaction, and is illustrate in FIG. 3, a perspective view of aggregate mixture blending apparatus 42, which is a poly pug mill where aggregate mixture is to be successively allocated from the raw material mixing apparatus 36 through an intake hopper 131 and enter into a first

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blending chamber 132. Aggregate mixture is to be dropped by its own gravity to a second blending chamber 133 through the discharging hole facilitate on the pedestal of the first blending chamber 132 successively while agitated. Likewise, aggregate mixture is to be continuously blended within the second blending chamber 133 resulting the edges, surfaces and ridges of aggregate are evenly absorbed with hydrated matters as shown in FIG. 4, designated "M2" which are generally gelatinous substances, such as hydrated silicate and hydrated aluminate thereby accomplishes the production of magma. Magma is to be successively despatched to the magma conveyor 44 through a discharging chute 134 controlled by pneumatic shutter and despatched to an adobe moulding apparatus 48 for moulding adobe.

A preferred embodiment of the present invention relates to the method and apparatus for magma production may also include the designed of ingredient with poly-agglomerant relating to adding of lime (CaO) and cement to the aggregate resulting an intact chemical reactions of adobe thereby improves the mechanical strength of non-sintering brick. The formation of non-sintering brick's ultimate mechanical strength starts from primary agglomeration followed by secondary agglomeration and post solidification. Referring now to FIG. 4 designated "M3", a cross section view of magma being suppressed to adobe illustrates the internal structure of adobe where aggregates are being snapped by the hydrated matters thereby forms an unified solid with initial mechanical strength which accomplishes the adobe's primary agglomeration. Primary agglomeration, as the step of current flow to aggregate mixture blending process is completed at the time when magma being moulded into shape with considerable amount of microscopic lime and cement particles partly adheres on the surface of aggregates, partly exuberated between granules thereby establishes the structural framework for the formation of brick's ultimate mechanical property. Lime with the existence of water and carbon monoxide is by nature having preferential chemical reaction compares to cement, both are agglomerants recommended in the present invention. Secondary agglomeration starts immediately upon magma being suppressed to shape which involves mainly of lime's hydration couples with a series of chemical reactions with the oxidants of aggregate, such as SiO_2 and Al_2O_3 etc. includes electrolytic dissociation, ion exchange,

ion absorption reaction and carbonisation thereby produce a great deal of hydrated silicate, hydrated aluminate, and other gelatinous substances. The resultants of these chemical reactions give rise to more contact points among aggregate and establish a foundation of spatial chain and web form of granules' structure which stabilises the mechanical structure of adobe formed in the primary agglomeration stage and reduces its capillary aperture. Post solidification is the final stage of shape and mechanical properties of non-sintering brick's formation process occurs in addition to secondary agglomeration correspondingly. It usually takes place 3 to 5 days after preliminary agglomeration which involves mainly of cement's chemical reactions thereby produces strong gelatinoid hydrated matters and forms a gelatinous bridge for aggregates resulting the cross linking of granulised structure and remedy the destructive capillary aperture thus consummating the internal structure of adobe and improves the mechanical property of non-sintering brick.

A preferred embodiment of the present invention relates to the mechanism of bi-directional adobe press machine resulting an even distribution of impetus toward the mould cavities brimming with magma. Referring now to FIG. 5, there is shown in schematic form the front and side view of the adobe moulding apparatus 48 which is generally composed by adobe press machine designated TA and magma feeding assembly designated TB. The adobe press machine TA of 3140KN nominal pressure is powered by a hydraulic transmission system 152 and fully automated by programmable logic controller to accomplish the entire adobe moulding process for which magma feeding assembly TB is facilitated to despatch magma to the mould cavities according to compacting ratio designed for specific brick designation. The adobe press machine adopts 4 beam/4 column structure and downward pressurising pattern coupled with elevated mould a frame beam 148 and a stationary multiple mould arm 151 thereby generates relative motion of top and bottom moulding pressure within the mould cavities resulting the effect of bi-directional suppression. More particularly, a main fluid server beam 142 links with a hydraulic fluid pitcher 141 is tightly connected with a base block 149 and four pieces of vertical column 146 by bolts and nuts thus form a rigid pressure reception framework to endure the payload while adobe moulding is in progress. The

ascending and descending movement of a top elevated beam 144 and a mould frame beam 148 guided by four vertical column 146 are respectively positioned between the main fluid server beam 142 and the base block 149. The main fluid server beam 142 adopts integral piston structure to motivate the ascending and descending movement of the top elevated beam 144 where the bottom of a piston cylinder 143 is connected with the top elevated beam 144. Two pieces of the mould frame fluid server 156 position at both sides of the adobe press machine are respectively fixed against the main fluid server beam 142 and its piston cylinder are joint with the mould frame beam 148. The travelling range of the top elevated beam 144 and the elevated mould frame beam 148 are respectively controlled by a stroke regulator 150. A mould 147 frame comprises of numerous mould cavities of specific brick designation with constant width and length being installed on the elevated mould frame beam 148 that the stationary multiple mould arm 151 are fastened against a base block 149. When the top elevated beam 144 and the elevated mould frame beam 148 are descending synchronously, magma crammed inside the mould cavities are being suppressed by the direct pressure from multiple top mould arm 145 and relative pressure from the bottom mould arms thereby realises the mechanism of bi-directional suppression of adobe. The relative pressure generates from the bottom mould arms are engendered as a result of descending motion of the mould frame beam 148 against magma crammed on top of the stationary multiple mould arm 151 inside the mould cavities.

A preferred embodiment of the present invention may also include consummating the adobe moulding process resulting an even granule distribution among the body structure of adobe with adequate capillary aperture thereby form the mechanical property of brick with water absorption rate involves (a) feeding of magma into mould cavities according to compacting ratio designed for specific brick designation; (b) multistage bi-directional suppression of magma crammed inside the mould cavities to form an adobe; (c) demoulding of adobe, and (d) despatching of adobe. Referring now to FIG. 5, a magma feeding assembly designated TB which is integrally linked with the adobe press machine TA and facilitating the transmission of magma from the discharging chute 134 of FIG. 3 to the magma carrier 155 through a buffer 154 and feeds into the mould cavities

volumetrically. More particularly, the volumetric feeding of magma is accomplished by (a) the magma carrier 155 moves forward to push the adobes from the moulding deck to an adobe reception bench 117; (b) the elevated mould frame beam 148 ascends and lift up the magma carrier 155 to set the depth of mould cavities according to compacting ratio at the time after adobes are being pushed forward thereby mould cavities are permeated with magma, and (c) the magma carrier 155 retreats and scrapes the excessive magma from the mould cavities thereby accomplishes the volumetric feeding process. The ascending range of the elevated mould frame beam 148 governed by a stroke regulator 150 is to be programmed according to the pre-suppression height based on designed compacting ratio.

Further referring to FIG. 5 an adobe press machine designated TA, the multistage bi-directional suppression processes is accomplished by descending of the multiple top mould arm 115 and the mould frame 147 synchronously resulting the positive and relative impetus evenly distributes towards the top and bottom sides of magma crammed inside mould cavities. The speed and impetus for the descending of the multiple top mould arm 145 and the mould frame 147 are to be pre-set according to the designed operating parameter through programming of programmable logic controller. The suppression of magma crammed inside the mould cavities starts immediately after the magma carrier 155 is retreated, which include (a) light impetus suppression; (b) air displacement; (c) high impetus suppression; (d) conservative suppression; (e) discharging of impetus; (f) descending of mould frame; (g) ascending of multiple top mould arm, and (h) despatching of adobe. More particularly, light impetus suppression is to orientate the granules' position inside the mould cavities to embryonic form of adobe and release within second thereby air displacement take place resulting the displacement of granules. High impetus suppression followed by conservative suppression are orderly succeeding the light impetus suppression to compact granules inside the mould cavities to permanent position thereby accomplish the primary agglomeration of adobe resulting the formation of its initial mechanical strength. At this stage, the mould frame 147 is descending and adobes are stationary emerged from the mould cavities and sit on top of the stationary multiple bottom arm 151 with the multiple top mould arm 145 ascending synchronously.

Adobes therefore being pushed forward to the adobe reception bench 157 by the magma carrier 155 thereby complete the magma suppression cycle.

While specific embodiment of the invention have been shown and described in
5 detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

**CLAIMS**

1. The apparatus for producing magma from raw aggregate for making ion-sintering brick, comprising
 - 5 (a) means for regulating the chemical property of the raw aggregate to strengthen the intensity of the non-sintering brick;
 - (b) means for regulating the physical property of the raw aggregate to establish the mechanical framework for non-sintering brick;
 - (c) means for regulating the moisture content of the raw aggregate;
 - 10 (d) means for compounding an aggregate mixture containing the raw aggregate and a poly-agglomerant; and
 - (e) means for accelerating the chemical reactions of the aggregate mixture to enhance the growing of hydrated matters and evenly absorb on the surface, edges and ridge of the aggregate.
- 15 2. The apparatus as set forth in Claim 1, wherein the means for regulating the chemical property of the raw aggregate comprises
 - (a) an aggregate feeding hopper having a scarifier being attached thereto;
 - (b) a grid breaker attached to the aggregate feeding hopper having being
20 mounted with an adjustable material flow shutter;
 - (c) a silica sand feeding hopper having being mounted with a second scarifier;
 - (d) a second adjustable material flow shutter attached to the silica sand feeding hopper, and
 - 25 (e) a dehumidifier linked to a primary crusher.
3. The apparatus as set forth in Claim 1, wherein the means for regulating the physical property of raw aggregate comprises
 - (a) a primary crusher;
 - 30 (b) a secondary crusher; and
 - (c) a vibrating sieve attached to the secondary crusher.



4. The apparatus as set forth in Claim 1, wherein the means for compounding of the aggregate mixture comprises

- (a) a first agglomerant feeder being mounted with a spiral conveyor for adding calcium monoxide to the aggregate before a secondary crushing;
- 5 (b) a coercive pug mill having being mounted with an electronic scale to allocate raw material for production of the aggregate mixture;
- (c) a second agglomerant feeder attached to the coercive pug mill for adding cement to the aggregate by weight after the secondary crushing;
- 10 (d) a hygrometer linked with a programmable logic controller to regulate the moisture content of the aggregate; and
- (e) a water sprinkle attached to the coercive pug mill for adjusting the moisture content of the aggregate mixture.

15 5. The apparatus as set forth in Claim 1, wherein the means for accelerating the chemical reactions of the aggregate mixture includes a poly pug mill.

6. An apparatus for preliminary agglomeration of adobe comprises

- (a) means for transmitting impetus towards the top and bottom sides of mould cavities brimming with magma synchronously; and
- 20 (b) means for volumetric feeding of magma to mould cavities.

7. An apparatus as set forth in Claim 6, wherein the means for transmitting impetus towards the top and bottom sides of the mould cavities brimming with magma synchronously comprises

- 25 (a) an automatic adobe press machine powered by a hydraulic transmission system;
- (b) a set of multiple top mould arm motivated by an upper elevated server beam attached to the abode press machine;
- (c) a mould frame mounted with a plurality of mould cavities fixed onto an elevated lower mould frame beam attached to the adobe press machine; and
- 30 (d) a stationary multiple mould arm fixed tightly to a base block of the adobe press



machine.

8. An apparatus as set forth in Claim 6, wherein the means for volumetric feeding of magma to the mould cavities comprises
 - 5 (a) a magma buffer mounted to the rear portion of the adobe press machine;
 - (b) a magma carrier mounted with a horizontal travelling guide moving between the magma buffer and a mould deck of the adobe press machine.
9. A method of preliminary agglomeration of adobe using the adobe press machine comprising the steps of :
 - 10 (a) preparing poly-agglomerant ingredient for a specific brick designation;
 - (b) regulating of a raw aggregate;
 - (c) volumetric feeding of magma into mould cavities;
 - (d) multistage bi-directional suppressing the magma in the mould cavities to form the abode; and
 - 15 (e) demoulding of the adobe.
10. A method for preliminary agglomeration of adobe as set forth in Claim 9, wherein the poly-agglomerant ingredient comprises
 - 20 (a) an inorganic matter content of the raw aggregate;
 - (b) a grain composition of the raw aggregate;
 - (c) a quantity of an agglomerant selected from lime (CaO) and cement; and
 - (d) moisture content of the aggregate mixture.
- 25 11. A method for preliminary agglomeration of adobe as set forth in Claim 9, wherein the step of regulating the raw aggregate comprises the step of adding silica sand to the raw aggregate, and preliminary and secondary crushing followed by a screening process.
- 30 12. A method for preliminary agglomeration of adobe as set forth in Claim 9, wherein the volumetric feeding of magma into the mould cavities of the adobe press



machine comprises

- 5 (a) lifting the mould frame upward by ascending the lower elevated mould frame beam while the adobes are being pushed forward to an adobe transmission bench by an magma carrier and concurrently pouring of magma into the mould cavities; and
- (b) retreating the magma carrier to scrape an excessive magma from the mould cavities and loading of new magma.

10 13. A method for preliminary agglomeration of adobe as set forth in Claim 9, wherein the multistage bi-directional suppressing of magma in the mould cavities comprises the steps of

- (a) descending a plurality of top mould arms of the adobe press machine and submerging the bottom mould frame beam with a stationary multiple mould arm holding magma within the mould cavities; and
- 15 (b) setting the respective strength and speed for light impetus suppression.

20 14. A method for preliminary agglomeration of adobe as set forth in Claim 9, wherein the demoulding of the adobe comprises the steps of submerging of the lower mould frame beam and ascending of the multiple top mould arm by a programmable logic controller.