United States Patent [19]

Jones

[11] **3,837,466**

[45] **Sept. 24, 1974**

[54] **BRICK HANDLING**

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[21] Appl. No.: **295,613**

[52] **U.S. Cl.** **198/30,** 53/186
[51] **Int. Cl.** **B65g 47/24**
[58] **Field of Search** ..... 53/26, 159, 186; 198/19, 198/30, 29, 24; 214/8.5 C, 6 A

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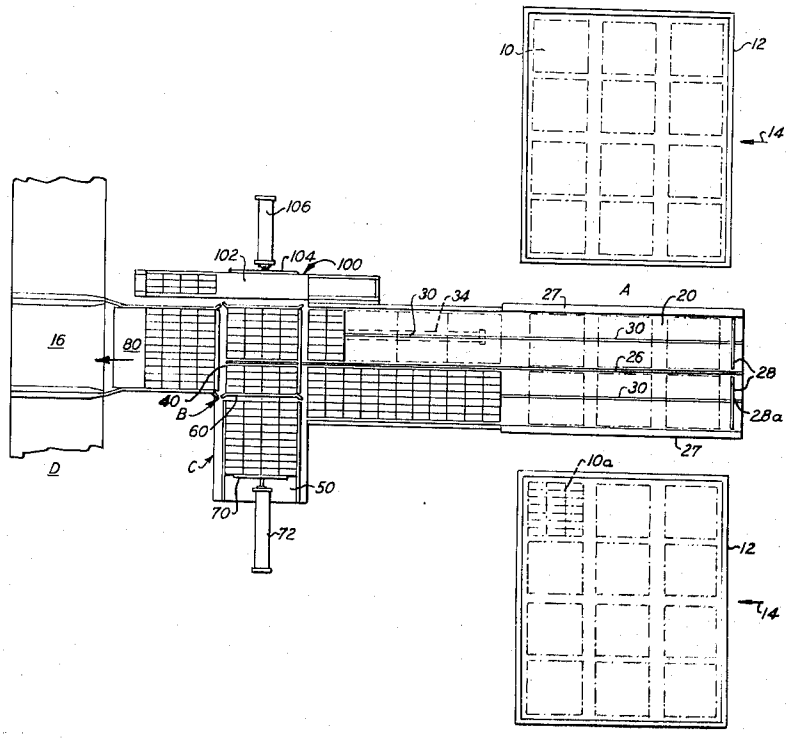
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Primary Examiner—Richard E. Aegerter
Attorney, Agent, or Firm—William E. Mouzavires

[57] **ABSTRACT**

An automatic handling of brick for assembling bricks into a standard brick pack for shipment, method and apparatus whereby bricks are transferred from a kiln car or other supply station to a transfer or blending station in a predetermined number of rows; a certain number of rows are removed from said bricks at said transfer station to reduce the number of rows for further processing at a further station beyond said transfer station; the removed rows of bricks are accumulated and subsequently added to another group of bricks conveyed to said transfer station to form a third group of bricks suitable for processing at said further station. The above process not only serves to assemble the bricks into a predetermined size suitable for receipt in trays of a conveyor used for further processing the bricks into a standard brick pack, but it also serves to blend the bricks with the objective of obtaining a uniform blend of bricks within each brick pack to be formed.

36 Claims, 6 Drawing Figures



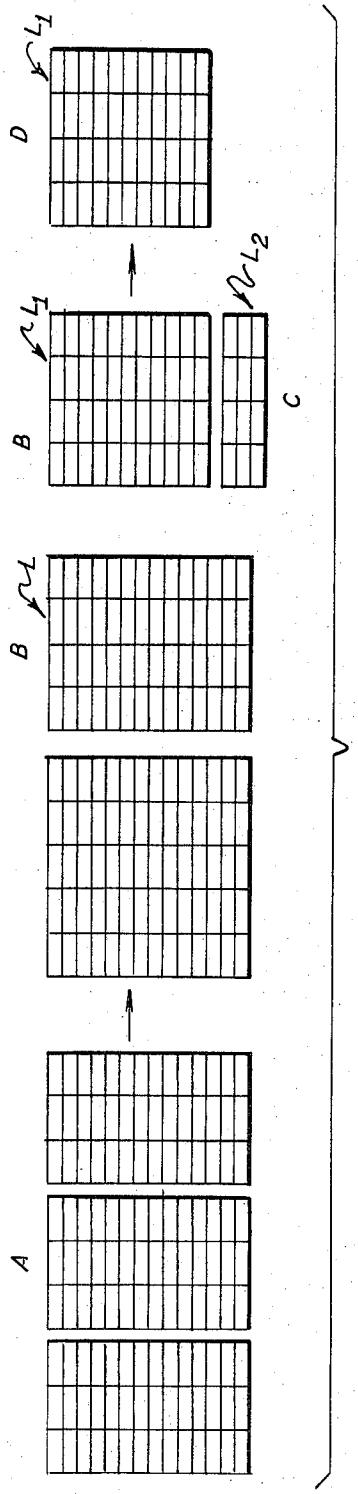


Fig-1

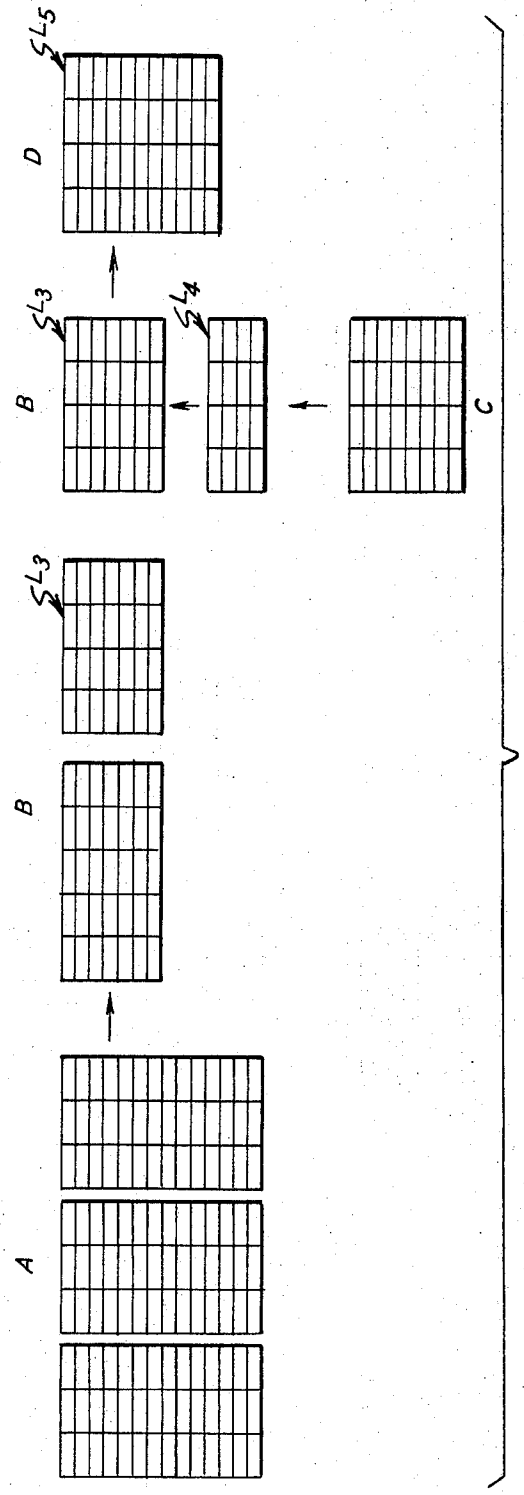


Fig-2

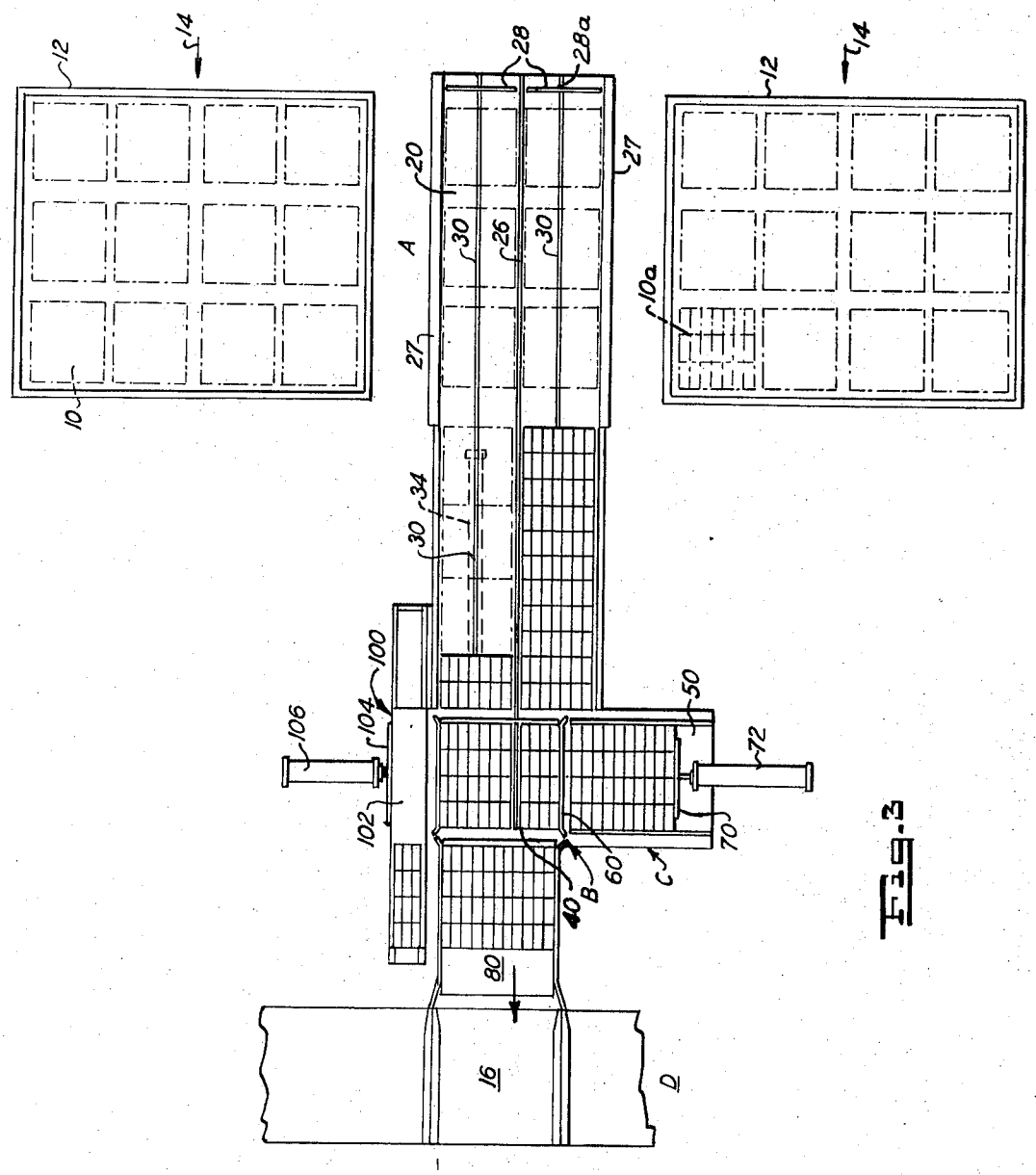

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28a
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10a
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Fig. 3

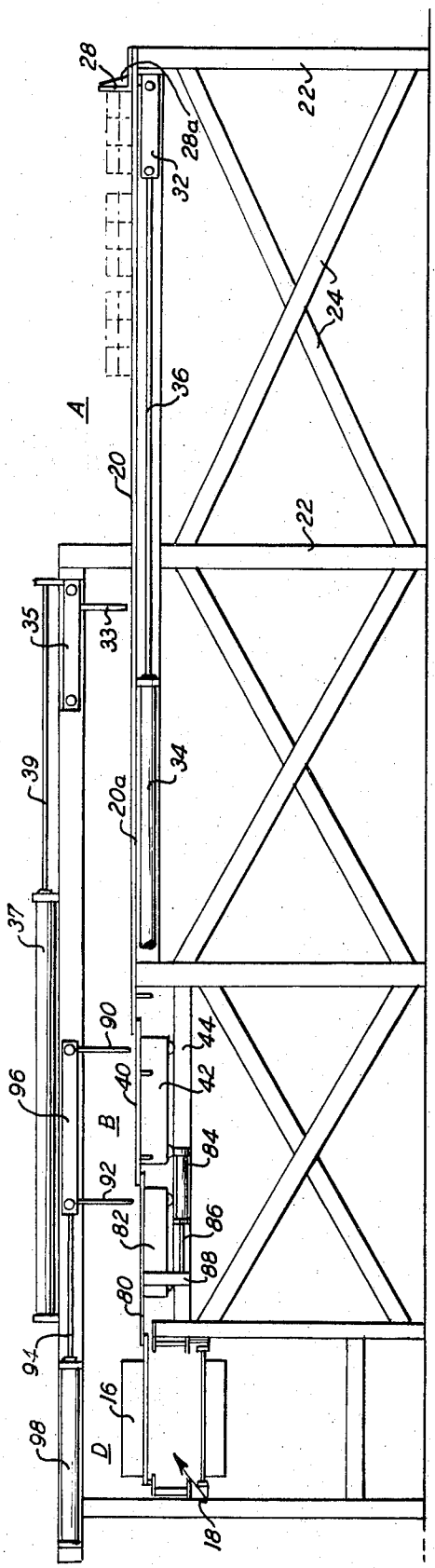

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Fig.4

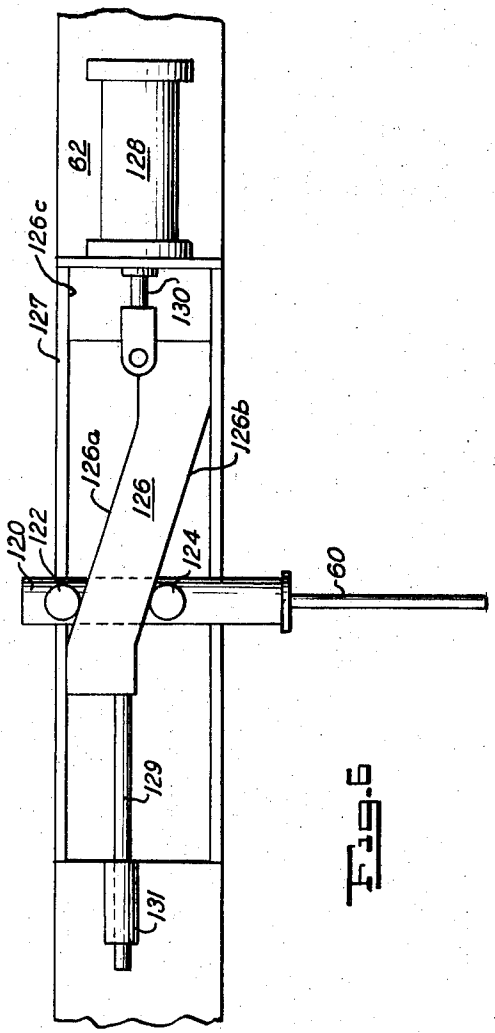

62
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126c
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130
126b
126a
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Fig.5

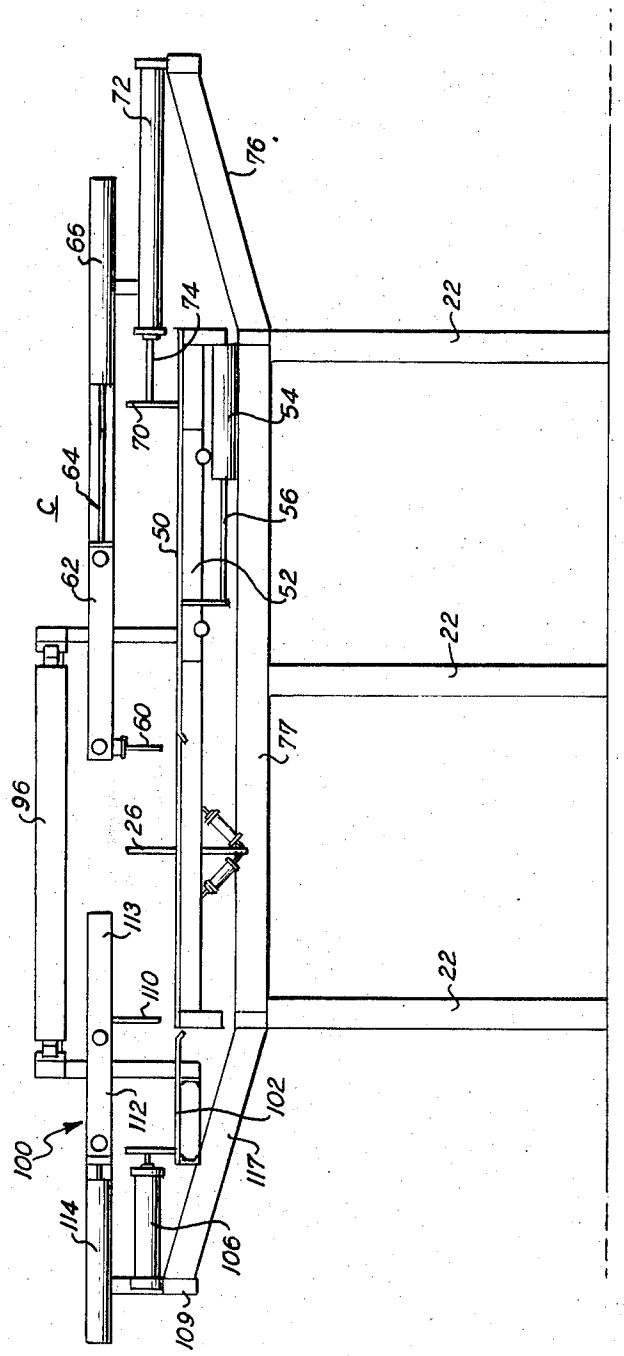

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Fig-5

BRICK HANDLING

BACKGROUND OF INVENTION

In many brick handling operations today, new brick are taken from the kiln where fired and dried, and assembled into a standard brick pack usually tied by steel strapping, for shipment to the market or other points of retail. One standard brick pack consists of ten layers of brick with each layer including eleven rows with five bricks in each row. In many brick packs, a pair of voids are formed in the third layer of bricks to accommodate the tines of a forklift truck.

In order to enable maximum flame penetration and heat contact, bricks are stacked in spaced groups while in the kiln and in most common situations, the bricks are stacked in such spaced groups on kiln cars movable on tracks into and out of the kiln. These groups consist of multilayers of bricks with each layer including seven rows with each row including three bricks (commonly referred to as "7 over 3") or eight rows of bricks with each row including three bricks (referred to as "8 over 3")or 10 rows of bricks with each row including four bricks (commonly referred to as "10 over 4"). Depending upon the density of a brick as well as its position in the kiln and its position in a stack of bricks relative to flame penetration or heat contact, while in the kiln a brick may be fired and dried to a different degree. This creates the problem of how to obtain a uniform blend of different bricks in each ultimate standard brick pack when employing automatic or semiautomatic machinery for removing the brick from the kiln car for further processing into a standard brick pack.

In recent years with the emphasis on automation, apparatus have been developed to automatically or semiautomatically stack bricks into said standard brick pack subsequent to leaving the kiln. In one commercial apparatus for stacking bricks invented by applicatant and disclosed in pending U.S. Pat. application Ser. No. 153,577, filed June 16, 1971, the bricks are prestacked into discrete trays of a horizontal conveyor and then discharged from the conveyor for further stacking on an elevator and eventual transfer to a steel strapping station where the final brick pack is strapped. As will be apparent from the objects of the invention, appearing below, the present invention is concerned with handling the bricks after they leave the kiln or from an equivalent supply station to arrange the bricks in a predetermined size and with a uniform blend to enable the bricks to be automatically processed for stacking into multilayered brick pack for shipment to market or retail points or otherwise.

OBJECTS OF INVENTION

It is an object of the present invention to provide a novel method and apparatus for transferring brick from a kiln car or other supply area to a point for processing into a pack of multilayered bricks. With reference to applicant's prior apparatus disclosed in the above-identified U.S. application, utilizing a tray conveyor, it is a more specific object of the present invention to transfer while renumbering or adjusting the size of a group of bricks, from the kiln car or other supply area to a loading point to enable the bricks to be loaded onto the trays of the conveyor in rapid and efficient manner. Further included herein in such a method and

apparatus which will enable a plurality of trays to be loaded with a predetermined number of multilayered bricks regardless of whether the bricks are removed from the kiln car in a group not suitable for receipt into the trays or by means which cannot directly feed the trays.

Further included herein is a provision of such a method and apparatus which will enable the use of conventional or presently available commercial apparatus such as overhead "dehacking" apparatus for removing the brick from the kiln car for subsequent processing by automatic apparatus into brick stacks. Further included herein is a provision of such a method and apparatus which may be incorporated into existing brick manufacturing plants employing kiln cars which move on fixed tracks without requiring modification of the kiln car transportation system or the kiln cars themselves.

A further object of the present invention is to provide method and apparatus for grouping bricks with a desired blend of bricks which have been fired or dried to different degrees because of their density or position in the kiln as well as in a group relative to the flame or heat in the kiln.

SUMMARY OF INVENTION

In one application, the present invention is used for rearranging a group of bricks removed from a kiln car into a size suitable for receipt into the trays of a horizontal conveyor used for prestacking bricks and forming voids therein preliminary to further stacking on an elevator as disclosed in applicant's co-pending U.S. application Ser. No. 153,577, identified above. The trays in the aforedescribed conveyor are of a size which will accommodate eleven rows of brick. Although in said application Ser. No. 153,577 each of the eleven rows of bricks includes two bricks, the trays may be enlarged so as to accommodate more bricks in each of the rows, for example, as disclosed in the attached drawings, the trays may be enlarged so as to accommodate 11 rows with four bricks in each row ("11 over 4"). As noted above, the bricks when manufactured such as during the kiln process, are stacked in multilayered groups such as 7 over 3 or 8 over 3 or 10 over 4 which arrangements are not susceptible to direct transfer into the trays of said conveyor in an efficient manner utilizing the full space of the trays. The present invention enables resizing and rearrangement of the bricks after they are removed from the kiln and prior to feeding into the aforedescribed tray conveyor, so that, for example, in the instance where the tray conveyor can accommodate 11 rows of bricks with each row containing four bricks, the bricks removed from the kiln cars will be rearranged in accordance with the present invention to place them into an "11 over 4" arrangement for receipt into the trays of the conveyor.

The present invention may also be employed to ensure that the various layers of brick of a standard brick pack will be composed of bricks taken from different positions in the stack on the kiln car, and consequently will include bricks dried or fired to different intensities so as to ensure a uniform blend of bricks in the ultimate brick pack. In situations where there is no need to readjust the size of the brick as it leaves the kiln prior to feeding into the tray conveyor or otherwise, the present invention may still be employed to provide suitable

blending of the bricks so that each ultimate brick pack will have a uniform blend of bricks.

With specific reference to a typical brick plant installation (for purposes of illustration only) wherein bricks are stacked on a kiln car in a plurality of spaced groups with each group including layers of "7 over 3 "(seven rows with each row including three bricks), the above and other objects of the present invention are achieved by first removing two groups of bricks, each group containing two layers of 7 over 3 bricks from the kiln cars and placing the groups on a horizontal platform in side-by-side relationship so as to form fourteen rows of bricks with each row containing three bricks. This process is repeated several times placing the subsequent groups of brick on the platform behind the preceding groups so that the platform contains two layers of 14 generally parallel rows of bricks with each row containing multiples of three depending on how many groups are placed on the platform.

The platform is provided with a pair of elongated slots through which pusher members are mounted for pushing the groups respectively along the platform in a horizontal plane to what will be termed a "transfer" or "blending" station. At the transfer station there is a second movable, platform generally coplanar with the first platform but capable of movement relative to the first platform to separate a leading portion from the group of bricks so that the leading portion will consist of fourteen rows of brick with each row including four rows.

While at the transfer station, the leading portion of the bricks partly rests on a third platform which is on one side of and generally coplanar with, the second platform and is capable of moving relative to the second platform in a direction at right angles to the direction of movement of the bricks along the first platform. The third platform is then actuated to move laterally away from the second platform to separate or remove three rows of bricks thus leaving 11 rows of bricks with each row containing four bricks. The latter arrangement is precisely what the trays in the conveyor will accommodate. The 11 rows with four bricks in each row are then conveyed by a pusher member from the second platform to another station from which they are fed into the trays of the conveyor.

Another group of fourteen rows of bricks is then pushed from the stationary platform to the second and third movable platforms and reduced to 11 rows with each row including four bricks in the same manner described above. The three rows of brick removed in this step are accumulated on the third platform together with the three rows previously removed. The above process is repeated two more times until 12 rows of removed brick have been accumulated. At this juncture, instead of next conveying 14 rows of brick from the stationary platform to the movable platforms, only seven rows of brick are conveyed from the stationary platform to the second, movable platform. Then four rows of the accumulated brick are added to the seven rows to make 11 rows suitable for receipt in the trays of the conveyor. This process of adding the four rows of brick to the seven rows of brick is repeated 3 times until the 12 rows of removed and accumulated bricks have been added back into the system at which point resumption of feeding of 14 rows of brick to the movable plates may begin and the above process of removing three rows four times until 12 rows are accumulated, is repeated.

In situations where the groups of bricks removed from the kiln cars or other supply area need not be resized in order to fit the trays of a conveyor or other processing equipment, the above process may nevertheless be used to rearrange or blend the bricks that are being handled with the aim of obtaining as much uniformity as possible in the blend of the bricks in the ultimate brick pack to be formed. If it is desired to increase the blending capability of the above-described apparatus, an additional platform may be added on the other side of the second platform to remove and subsequently replace bricks or add new bricks to the system for blending purposes.

It should be remembered that the above process was described in relation to groups of bricks stacked in a supply area in layers of 7 over 3 (seven rows, three bricks in each row). If, instead of the latter, the bricks are arranged in stacks consisting of layers of 8 over 3 (eight rows, three bricks in each row), then it should be noted that in the initial phase of the process, 16 rows of bricks will be conveyed to the transfer station and five rows will be removed from the 16 rows leaving the desired 11 rows for receipt in the trays of the conveyor. Removal of the five rows is effected 3 times whereby 15 rows of removed brick are accumulated on the third platform. At this point only eight rows of brick are successively conveyed from the first platform to the second platform 5 times during which phase three rows of the accumulated brick are added to the eight rows 5 times respectively, thus resulting in the required eleven rows for receipt into the trays of the conveyor.

In situations where the bricks at the supply area or on the kiln car are stacked in layers of 10 over 4 (10 rows, each row having four bricks), it will be understood that in the initial phase, 20 rows of brick will be conveyed to the transfer station, and nine rows will be removed at the transfer station leaving the desired 11 rows. Subsequently 10 rows will be successively conveyed from the fixed platform to the transfer station and one row will be successively added nine times to the 10 rows respectively to produce the desired 11 rows. It will also be appreciated that other numerical brick arrangements may be resized and blended in accordance with the present invention. Furthermore, although in the specific application described above, the resizing of the brick groups is for purposes of accommodating the trays of a tray conveyor, the resizing may be used for other purposes or other conveyors not employing trays.

DRAWINGS

Other objects and advantages of the present invention will become apparent from the following more detailed description taken in conjunction with the drawings in which:

FIG. 1 is a brick flow diagram in plan view illustrating steps in handling brick in accordance with the method of the present invention;

FIG. 2 is a flow diagram similar to FIG. 1 but showing the method of handling bricks in advanced stages;

FIG. 3 is a plan view illustrating method and apparatus in accordance with the present invention for resizing and rearranging brick;

FIG. 4 is a front elevational view of the apparatus shown in FIG. 3 with certain parts removed for clarity;

FIG. 5 is an end elevational view taken from the left-hand end of FIG. 3 with certain parts removed; and

FIG. 6 is a detail view illustrating how certain gates and fences included in the apparatus are raised and lowered.

DETAILED DESCRIPTION

Referring now to the drawings in detail, and initially to FIG. 1, the broad concept of the method of the present invention is disclosed wherein at station A bricks from the kiln car or other supply area stacked in layers of 7 over 3 are assembled to form 14 rows of brick. The bricks containing the 14 rows are then conveyed to station B where they are separated into a leading portion L containing 14 rows with each row containing four bricks. Next, while at station B, leading portion L is subdivided into two sub-groups L_1 and L_2 by separating three rows of bricks (L_2) from sub-group L_1 and moving them laterally to station C. This leaves sub-group L_1 with 11 rows with each row containing four bricks which is precisely what is desired for further handling such as feeding into the trays of the conveyor described above. In the next step, sub-group L_1 is conveyed to a station D for subsequent feeding into the trays of the conveyor.

The three rows of brick removed at station B are accumulated at station C and the above process is repeated 4 times until 12 rows of brick have been accumulated at station C. At this juncture, and now referring to FIG. 2, only seven rows of brick are conveyed from station A to station B where they are separated into a leading portion L_3 containing seven rows with each row containing four bricks. While at station B four rows of previously removed and accumulated bricks from station C (L_4) are added to the group L_3 to constitute a new group L_5 containing eleven rows of brick with each row containing four bricks as is desired. This leaves eight rows of brick at station C which may then be returned to the system by repeating the process represented in FIG. 2 2 more times. The entire process may then be repeated, that is, removing three rows of bricks 4 times and restoring four rows of bricks 3 times. It will be seen that not only is the desired sizing of, 11 over 4, achieved but also the bricks are interchanged into different groups to achieve a desired blending of the bricks. It should be noted that FIGS. 1 and 2 are plan views and thus while they show only one layer of bricks being rearranged, a plurality of layers may be rearranged simultaneously in accordance with the present invention. In the specific case where the tray conveyor is to be fed with two layers of 11 over 4 brick, the method of the present invention is applied to two layers of bricks.

The above process will become clear upon reference to FIG. 3 which shows apparatus which may be employed to carry out the method. Bricks are brought to station A to form 14 rows of bricks, from stacks 10 of bricks on two kiln cars 12 which have travelled on tracks, not shown, in the direction of arrows 14 to station A from a kiln (not shown). In the specific application illustrated, the stack 10 of bricks on the kiln cars are arranged in layers of seven over three (seven rows of bricks with each row containing three bricks). Any suitable means may be employed to move the layers of bricks from stacks 10 to station A, one means employed in one commercial installation, being what is termed an "overhead dehacker" which grips two entire layers of seven over three bricks while on stack 10 and traverses to station A and deposits them to form fourteen rows of brick as illustrated in FIG. 3. This process is repeated until the rear section of platform 20 is fully loaded with two layer stacks of 7 over 3 bricks as shown in FIG. 3.

In the shown embodiment, station A is comprised of a stationary platform 20 supported in a horizontal plane above a ground surface by means of structural steel columns 22 reinforced by diagonal beams 24 as illustrated in FIG. 4. Platform 20 is divided in two equal lateral sections by an upstanding fence 26 shown in FIGS. 3 and 5 but omitted from FIG. 4 for purposes of clarity. Upstanding from the side edges of platform 20 are angle members 27 shown in FIG. 3 which together with fence 26 serve to form two parallel guideways for conveying the bricks along platform 20 to station B; there being seven rows of brick on one side of fence 26 and seven rows of brick on the other side of fence 26 as shown in FIG. 3.

Conveyance of the bricks from station A toward station B is achieved in the first stage by a pair of pusher members 28 in the form of vertical plates mounted on arms 28*a* which extend through a pair of parallel elongated slots 30 extending longitudinally in platform 20 as best shown in FIG. 3. Actuation of each pusher member 28 along platform 20 is achieved in the shown embodiment through an associated fluid motor such as an air motor 34 having an actuating rod 36 connected to a carriage 32 movable below platform 20 as shown in FIG. 4. Although only one fluid motor 34 and carriage 32 are shown, there are two such motors and carriages respectively connected to pusher members 28 through means of arms 28*a* which extend through slots 30. Carriage 32 may be mounted in any suitable rail structure to be movable below platform 20 in a plane parallel thereto.

After the bricks are conveyed to the front section 20*a* of platform 20, see FIG. 4, they are then conveyed to transfer station B by means of overhead pusher members 33 mounted for vertical movement (as will be described subsequently) on overlying carriages 35 which in turn are mounted along overhead tracks above platform 20 to be actuated by any suitable means such as air cylinders 37 having actuating rods 39 suitably connected to carriages 35. Although only one pusher member 33 is disclosed in FIG. 4 there are two pusher members 33 capable of operating independently of each other for pushing the bricks on opposite sides of fence 26 to station B. Pusher members 33 have been omitted from FIG. 3 for purposes of clarity. Use of pusher members 33 enables pusher members 28 to be returned to their starting position for permitting more bricks to be loaded from the stacks 10 on kiln cars 12 to platform 20 as the processing of the previously loaded brick continues at station B.

By the time the bricks reach the forward section 20*a* of stationary platform 20 they will have been moved into end-to-end abutting engagement as shown in FIG. 3. Continued conveyance of the bricks by means of pusher members 33 brings them to transfer station B which includes a movable horizontal platform 40 longitudinally aligned in the path of platform section 20*a* but slightly below the plane thereof to permit movement of

platform 40 relative to platform 20 to separate the leading portions of the bricks so that each row contains four bricks as shown in FIG. 3. Referring now to FIGS. 3 and 5, transfer station B also includes an other movable platform 50 generally coplanar with movable platform 40 but projecting laterally to one side thereof at right angles as shown in FIG. 3. In the specific embodiment shown, when the brick reach transfer station B from forward section 20*a* of stationary platform 20, 11 rows of brick will be resting on movable platform 40 while the remaining three rows will be resting on movable platform 50.

In order to separate the three rows of brick resting on movable platform 50 from the remaining eleven rows resting on movable platform 40, movable platform 50 is actuated laterally outwardly away from platform 40 by means of an air cylinder 54 having an actuating rod 56 connected to a carriage 52 on which movable platform 50 is fixed as shown in FIG. 5. Carriage 52 may be mounted on rails suitably supported above the cross beam 77 fixed across upper portions of columns 22 as shown in FIG. 5.

After the three rows of bricks are removed by means of movable platform 50, the eleven remaining rows may then be advanced forwardly beyond transfer station B for subsequent feeding into the tray 16 of conveyor 18 shown in FIGS. 3 and 4. In order to contain the eleven over four rows of brick on platform 40, a vertical movable gate 60 (see FIG. 3) is lowered to the left-hand side of the group of bricks. The same may be effected on the right-hand side of the group of bricks on platform 40 by means of a vertically movable gate 110. Referring to FIG. 5, vertically movable gate 60 is suspended from an overhead carriage 62 movable in a horizontal plane above movable platform 50 by means of an air cylinder 66 and an actuating rod 64 connected to carriage 62. Similarly, vertically movable gate 110 is suspended from a carriage 112 movable in horizontal plane above platform 40 by means of an air cylinder 114.

Referring to FIG. 6, the vertical movement of gate 60 is achieved by means of a stem 120 from which gate 60 depends. Stem 120 extends vertically through the carriage 62 in a frame 127 fixed on carriage 62. Stem 120 contains a pair of spaced cam followers 122 and 124 which receive a cam member 126 having cam surfaces 126*a* and 126*b* respectively engagable with cam followers 122 and 124 to raise or lower stem 120 and consequently gate 60 depending upon the amount and direction of linear movement of cam 126 in frame 127. Reciprocation of cam 126 is achieved through an air cylinder 128 fixed to frame 127 and having an actuating rod 130 connected to cam 126 as shown. Cam 126 is guided in its path of movement by its edges 126*c* engaging portions of frame 127 and also by a guide rod 129 slidably received in a sleeve 131 fixed to frame 127. The same mechanism described and shown in FIG. 6 may be employed to raise and lower gate 110 as well as the pusher members 33 described above.

Referring to FIGS. 3 and 4, the group of bricks resized to eleven over four on movable platform 40 are advanced to another movable platform 80 situated in advance of platform 40 in generally coplanar relationship, but with platform 80 spaced slightly below platform 40. From platform 80 the group of bricks may then be fed directly into tray 16 of conveyor 18 as indicated by the arrow in FIG.3. Conveyance of the group of bricks from platform 40 to platform 80 is achieved through an overhead pusher member 90 while conveyance from the platform 80 into tray 16 is achieved by another overhead pusher 92. Referring to FIG. 4, pusher 90 is mounted for vertical movement in a carriage 96 which is movable in a horizontal plane over platforms 40 and 80 in a suitable track under actuation by an air cylinder 98 connected to carriage 96 by an actuating rod 94. Pusher member 92 is also suspended for vertical movement from carriage 96 so that it moves horizontally simultaneously with pusher member 90. Thus, when pusher member 90 is transferring bricks from platform 40 to platform 80, pusher member 92 will be transferring the previously sized bricks from platform 80 directly into tray 16 of conveyor 18. Because of fence 26 pusher member 90 is vertically slotted (not shown) in the mid-section thereof to receive and accommodate fence 26.

Vertical movement of pusher members 90 and 92 is achieved in the same manner as described above in connection with gate 60 illustrated in FIG. 6, therefore, it need not be repeated here. However, it is noted that the forward movement of platform 40 relative to stationary platform 20 provides space permitting pusher member 90 to descend to engage the rearmost bricks on platform 40. This space is shown in FIG. 3. In order to provide a similar space accommodating pusher member 92 to permit it to descend between the bricks on platform 40 and the bricks on platform 80, platform 80 is mounted on a carriage 82 to permit it to move relative to platform 40 to provide a space for accommodating pusher member 92. Carriage 82 may be actuated by the same air cylinder 84 employed to actuate carriage 42 associated with movable platform 40. This is accomplished by providing a lost motion connection between carriage 82 and carriage 42 so that upon initial actuation of carriage 82 only it together with its associated platform 80 will move to create a space for accommodating pusher member 92. Continued movement of carriage 82 will establish positive connection between it and carriage 42 to then permit carriage 42 and platform 40 to move relative to stationary platform 20 to provide space for accommodating pusher member 90 as well as to separate the leading portion of the bricks so that four bricks are included in each of the rows of the bricks on platform 40 as described above. Although not shown, if desired, carriages 42 and 82 may be provided with their own air motors to act independently from each other.

After the three rows of bricks are removed at station B by means of movable platform 50, they are pushed back to the rear of platform 50 to make room for subsequent rows of bricks to be removed. When 12 rows have been accumulated they may then be returned to the system in accordance with the method described above by means of a pusher member 70 shown in FIGS. 3 and 5. Pusher member 70 may be suitably mounted for movement in a horizontal place over platform 50 through actuation by an air cylinder 72 connected to pusher member 70 by an actuating rod 74. Air cylinder 72 may be mounted to the main frame in a suitable manner such as through beams 76 (one shown).

If desired, the apparatus may be provided with a further blending and brick-sizing capability through means of an optional shuttle blender located at a station 100 on the side of platform 40 opposite movable platform 50 as shown in FIGS. 3 and 5. This optional

shuttle blender includes a horizontal platform **102** generally coplanar with movable platform **40** and extending alongside the latter to be moved alongside the latter in a horizontal plane for purposes of shuttling brick into lateral alignment with the brick located on plate **40.** Any suitable means (not shown) may be provided for shuttling platform **102.** With this feature, brick from another supply area may be introduced onto the shuttle platform **102** and then moved into alignment with the brick on platform **40** for addition thereto in order to achieve a desired blend. Conveyance of the brick from shuttle platform **102** to movable platform **80** is achieved by a pusher member **104** mounted above platform **102** to be actuated by an air cylinder **106** in a direction transversely across platform **102** at right angles to the main path of conveyance of the bricks along platforms **20, 40** and **80.**

Any suitable control means may be provided for coordinating and synchronizing the movements of the pusher members and the gates. Also the various movements of the pusher members and the gates may be controlled and supervised by an operator who may independently control the movements of each of the members through push button control. Also, limit switches and timers may be employed in achieving the desired synchronization. For example, a limit switch may be employed to be engaged by the leading bricks when they move to the forward end of movable platform **40.**

To summarize operation of the above apparatus, after the bricks have been transferred from stacks **10***a* on kiln cars **12** to the rear section of stationary platform **20** and with gates **33, 90** and **92** in raised position, pusher members **28** are actuated to advance the bricks to the forward section **20***a* of stationary platform **20.** At this point, pusher member **28** may be returned to their initial starting position shown in FIG. **4** while pusher member **33** is lowered to further advance the bricks onto movable platform **40.** During this latter phase, pusher members **90** and **92** will be in their raised positions permitting the bricks to move from section **20***a* of platform **20** onto platform **40.** Platforms **80** and **42** are then actuated forwardly to create spaces for accommodating pusher members **90** and **92** and also for separating the leading portion of bricks on platform **40** from the remaining portion on platform **20***a*. Platform **50** is then actuated and moved laterally outwardly relative to platform **40** to separate three rows of brick and move them to station C. Gates **60** and **110** may then be lowered on opposite sides of the eleven over four remaining bricks on platform **40.** Additionally, pusher members **90** and **92** may then be lowered after which the bricks on platform **40** may be pushed to platform **80** and the previously sized bricks on platform **80** may be pushed into tray **16** of conveyor **18.** Pusher members **90, 92** and **33** are then raised and the above operation is repeated 3 more times until 12 rows of brick have been accumulated on platform **50** at station C. At this juncture, only seven rows of brick on one side of fence **26** are next conveyed from platform **20** to movable platform **40.** Then four rows of brick from platform C are pushed by pusher member **70** onto platform **40** to form the desired eleven over four group of bricks on platform **40.** The foregoing procedure is repeated 2 more times until all of the accumulated brick at platform C have been returned into the system whereupon the entire process is repeated.

It will be appreciated that the above apparatus is also adaptable to stacks of bricks on the kiln cars arranged in 8 over 3 or 10 over 4 and other arrangements.

What is claimed is:

1. A method of handling articles such as bricks comprising the steps of: conveying a first group of bricks to a first station, removing a number of said bricks from said group at said first station, removing remainder of said first group from said first station, conveying a second group of bricks to said first station and adding a number of said removed bricks to said second group of bricks at said first station.

2. The method defined in claim **1** wherein said third group of bricks is less in number than said first group.

3. The method defined in claim **2** wherein said first group contains fourteen rows of bricks, and three rows are removed at said station, and wherein said second group contains seven rows, and wherein four rows of bricks are added to said second group to form said third group consisting of 11 rows.

4. The method defined in claim **2** wherein said first group of bricks contains 16 rows of bricks, and wherein five rows of bricks are removed at said station, and wherein said second group contains eight rows of bricks and wherein three rows of bricks are added to said second group to form said third group consisting of 11 rows of bricks.

5. The method defined in claim **2** wherein said first group of bricks contains 20 rows of bricks and wherein nine rows are removed at said station, and wherein said second group contains 10 rows of bricks and wherein one row of bricks is added to said second group to form said third group consisting of 11 rows.

6. The method defined in claim **1** wherein said first group of bricks are conveyed to said station in two sub-groups, said removed bricks are taken from one of said sub-groups, and wherein said second group has the same number of bricks as said sub-group.

7. The method defined in claim **6** wherein said sub-groups each have the same amount of bricks.

8. The method defined in claim **1** wherein said first group of bricks are conveyed in one direction to said first station, and wherein said bricks are removed from said first group and added to said second group in a direction transverse to said first direction.

9. The method defined in claim **8** wherein said first station includes two horizontal plates movable relative to each other in said transverse direction, and wherein said bricks are removed from said first group at said station by moving one plate laterally outwardly in said transverse direction relative to the other plate.

10. A method defined in claim **9** wherein said first group of bricks are conveyed to said first station in a plurality of parallel rows parallel to said first direction by means of a pusher member moving in a horizontal plane toward said first station from the trailing end of said first group of bricks.

11. The method defined in claim **10** wherein said first group of bricks minus the removed bricks are conveyed to said second station by a second pusher member.

12. The method defined in claim **11** wherein said first group of bricks are initially taken from a supply area and placed before said first pusher member and subsequently conveyed by said first pusher member to said first station.

13. A method defined in claim 1 further including the steps of conveying said first group of bricks minus said removed bricks from said first station to a further processing station and simultaneously conveying another group of bricks to said first station for removing bricks therefrom or for adding bricks thereto at said first station.

14. A method of handling articles such as bricks comprising the steps of: conveying a group of bricks arranged in generally parallel rows in one direction generally parallel to the rows of bricks to a first location, separating a leading portion of the group from a trailing portion of the group, separating said leading portion in a direction transverse to said one direction to divide said leading portion into two sub-groups, and conveying one of said sub-groups further in said one direction to an other location for further processing.

15. The method defined in claim 14 further including the steps of conveying said trailing portion in said one direction and separating said trailing portion in a direction transverse to said one direction to divide said trailing portion into two sub-groups.

16. The method defined in claim 15 further including the steps of conveying one of the sub-groups of said trailing portion in said one direction to another location, accumulating the other sub-groups of the leading portion and the trailing portion at said first location, conveying a further group of bricks to said location, and adding said other sub-groups to said further group of bricks at said location.

17. The method defined in claim 14 further including the steps of removing the trailing portion of the group from said location, conveying to said location an other group of bricks and adding the other sub-group of bricks to said other group of bricks at said location.

18. The method defined in claim 14 wherein said group of bricks when reaching said first location rest on two platforms movable relative to each other in said one direction, and wherein the platforms are moved relative to each other in said one direction to separate said group of bricks into said leading portion and trailing portion.

19. The method defined in claim 18 wherein said leading portion rests on one of said platforms and also on a third platform movable in a direction transverse to said first direction relative to said one platform, and wherein said one platform and said third platform are moved relative to each other in said transverse direction to separate said leading portion into said sub-groups.

20. A method of handling articles such as bricks comprising the steps of: successively conveying a first plurality of groups of bricks along a path to and beyond a first station, successively removing bricks from said plurality of groups of bricks while at said first station, accumulating the removed bricks until a predetermined number is accumulated, and returning the accumulated bricks to said conveyor path.

21. The method defined in claim 20 wherein the accumulated bricks are returned to said path in increments of the total amount of accumulated bricks.

22. The method defined in claim 21 wherein after the first plurality of groups of bricks have left said one station, a second plurality of groups of bricks are successively conveyed to said one station and then removed from said one station, and wherein said increments of the accumulated bricks are successively returned to each of the groups of bricks in said second plurality at said station.

23. The method defined in claim 22 wherein the number of bricks in each of said group of bricks of said second plurality is less than the number of each of said group of bricks in said first plurality.

24. The method defined in claim 23 wherein the number of bricks in each of said group of bricks of said second plurality after the accumulated bricks are added thereto equals the number of bricks in each of said group of bricks in said first plurality after said removal of bricks from said groups of bricks of said first plurality.

25. Apparatus for handling articles such as bricks comprising in combination; means for conveying a group of bricks in a plurality of parallel rows along a horizontal path to a first station, means at said first station for separating a number of said rows of bricks laterally from the remaining rows, and means for conveying the remaining rows to a further processing station, and wherein there is further included means for separating said group of bricks into a leading portion and a trailing portion prior to lateral separation of said number of rows.

26. Apparatus for handling articles such as bricks comprising in combination; means for conveying a group of bricks in a plurality of parallel rows along a horizontal path to a first station, means at said first station for separating a number of said rows of bricks laterally from the remaining rows, and means for conveying the remaining rows to a further processing station, and wherein there is further included means at said first station for adding a number of rows of said bricks to said group of bricks at said first station.

27. Apparatus for handling articles such as bricks comprising in combination; means for conveying a group of bricks in a plurality of parallel rows along a horizontal path to a first station, means at said first station for separating a number of said rows of bricks laterally from the remaining rows, and means for conveying the remaining rows to a further processing station, and wherein there is further included means for returning said removed rows of brick to said first station for addition to a subsequent group of bricks conveyed to said first station.

28. Apparatus for handling articles such as bricks comprising in combination; means for conveying a group of bricks in a plurality of parallel rows along a horizontal path to a first station, means at said first station for separating a number of said rows of bricks laterally from the remaining rows, and means for conveying the remaining rows to a further processing station, and wherein said first station includes first and second horizontal platforms on which the group of bricks are conveyed and wherein said second platform is movable relative to the other platform for separating said number of rows of said bricks from the remaining rows.

29. Apparatus defined in claim 28 wherein said first defined means includes a stationary horizontal platform preceding said first platform such that the bricks are conveyed along said stationary platform to said first platform, and means mounting said first platform for movement in a horizontal plane relative to said stationary platform for separating bricks.

30. Apparatus defined in claim 29 wherein said first defined means includes a pusher member movable over said stationary platform to push bricks therealong, and

wherein said means for conveying the bricks from said first station to the further processing station includes a second pusher member movable over said first platform.

31. Apparatus defined in claim **30** wherein there is further included means mounting said second pusher member for vertical movement.

32. Apparatus defined in claim **30** wherein said means mounting said first platform for movement in a horizontal plane relative to said stationary platform includes a carriage, and a motor for moving said carriage, and wherein said second platform is mounted on said carriage and wherein there is further included an other motor for operating said last defined carriage.

33. Apparatus defined in claim **28** wherein said further processing station includes a third horizontal platform situated adjacent said first platform and wherein there is included means associated with said third platform for conveying bricks from said third platform to a further processing station.

34. Apparatus for handling articles such as bricks comprising in combination; means for conveying a group of bricks in a plurality of parallel rows along a horizontal path to a first station, means at said first station for separating a number of said rows of bricks laterally from the remaining rows, and means for conveying the remaining rows to a further processing station, and wherein there is further included a pair of vertical gates movable in vertical planes on opposite sides of said first station for containing the bricks at said first station during movement by said last defined means.

35. A method of handling articles such as bricks to arrange them in a predetermined number of rows, the steps comprising in combination, successively conveying in one direction along a path a plurality of discrete groups of bricks with each group arranged in generally parallel rows with each row containing a plurality of bricks, periodically removing rows of bricks from said path and laterally of said one direction, storing in stationary parallel rows the removed rows of bricks at a storage station adjacent to and alongside said path, and successively returning to said path at least one row of the removed bricks and adding said one row to a certain one of said group of bricks which arrives at said storage station subsequent to the removal from said path of said one row to increase the number of rows in said last defined certain group of bricks, and then conveying said last defined certain group of bricks to a further processing station for stacking the same to ultimately form a multilayered brick pack.

36. Apparatus for handling articles such as bricks to arrange them in a predetermined number of rows, the apparatus comprising in combination; a horizontal path for conveying discrete groups of bricks with each group including a plurality of generally parallel rows of bricks with each row including a plurality of bricks, said path having a transfer station, means for successively conveying said discrete groups of bricks in one direction along said path to and away from said transfer station, said transfer station having a horizontal surface for receiving the groups of bricks arranged in generally parallel rows, a storage station positioned adjacent said transfer station out of the way of said path, transfer means positioned adjacent said transfer station and movable transversely of said one direction for engaging and removing rows of bricks from said transfer station to said storage station, and a second transfer means positioned adjacent said storage station movable in a direction transverse to said one direction for engaging and moving at least one row of bricks from the storage station to said path for adding said one row of bricks to a certain group of bricks on said path wherein there is further included at least one movable gate positioned on one side of the side transfer station for containing the bricks during away from said transfer station.

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