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Tokuno

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[54] **APPARATUS FOR PILING BOARDS**

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[73] Assignee: **Rengo Co., Ltd,** Osaka, Japan

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[52] **U.S. Cl.** ..... **198/35;** 198/237; 214/6 C; 271/214

[51] **Int. Cl.** **B65g 57/00**

[58] **Field of Search** ..... 198/33 AD, 82, 237, 35; 271/87, 214; 214/7, 6 B, 6 C

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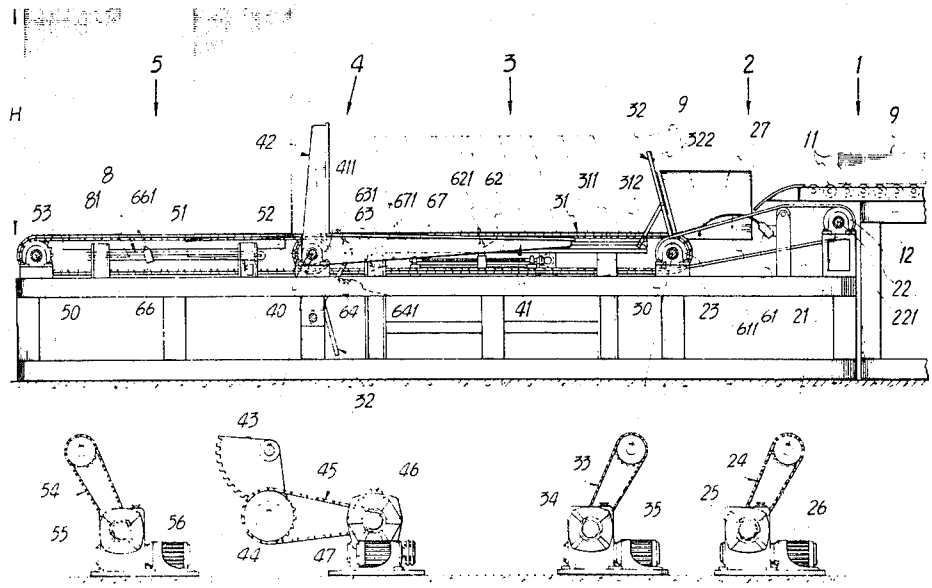
Assistant Examiner—Joseph E. Valenza
Attorney, Agent, or Firm—Stewart and Kolasch, Ltd.

[57] **ABSTRACT**

The present disclosure is directed to an apparatus for piling up, up to a comparatively higher place, boards or their small blocks which are successively fed, lying flatly. More particularly, the board piling up apparatus comprises a vertically erecting conveyer on which the boards are erected whose transporting face extends downwardly to a transporting conveyer which sequentially receives the boards erected on the erecting conveyer, and delivers them to the discharging end, a reversing gear which rotates and piles up the boards erected and arranged on the transporting conveyer, and a discharging conveyer which discharges the boards, stacked on the reversing gear, from the reversing gear.

8 Claims, 6 Drawing Figures



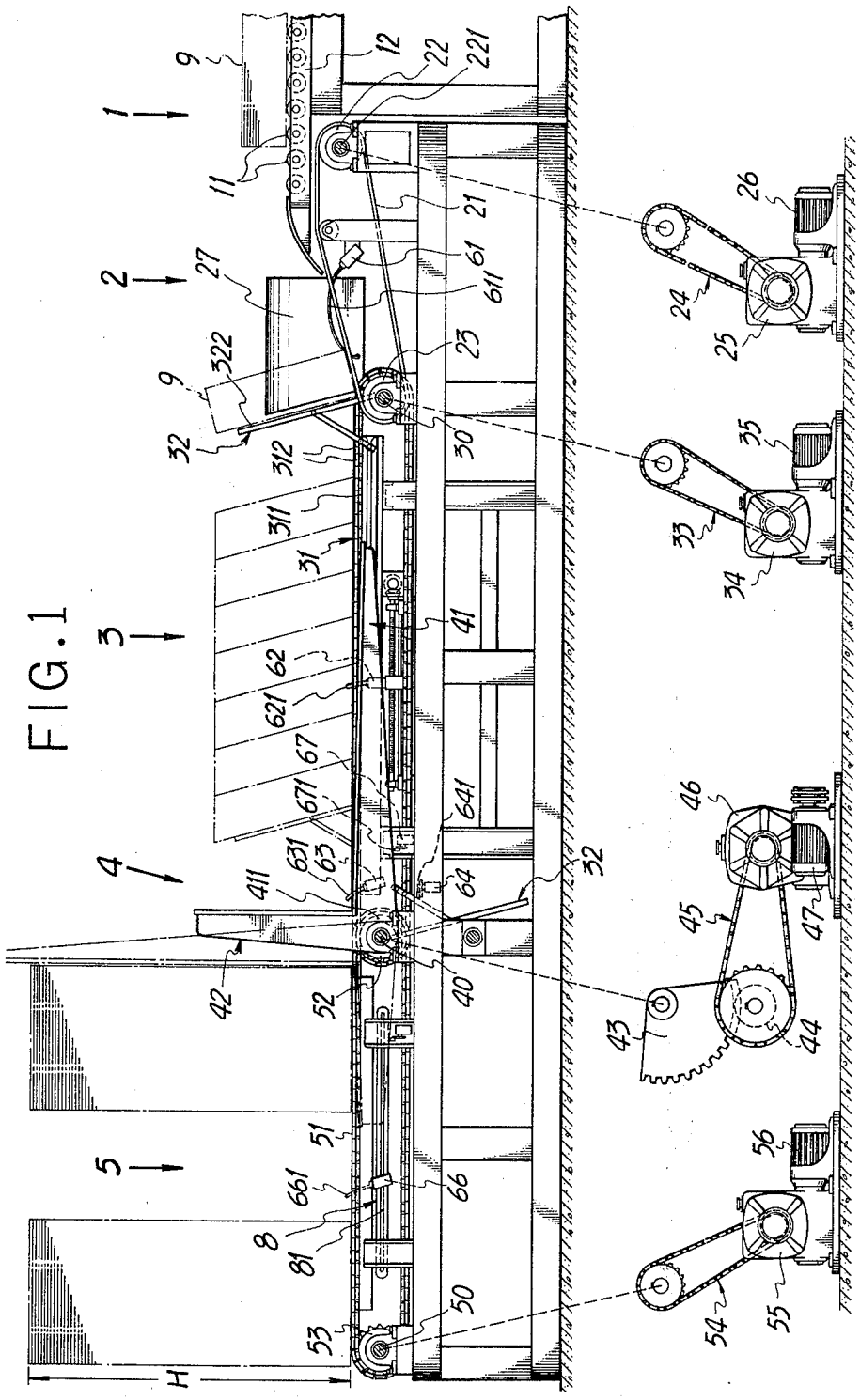

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FIG. 1

FIG. 2

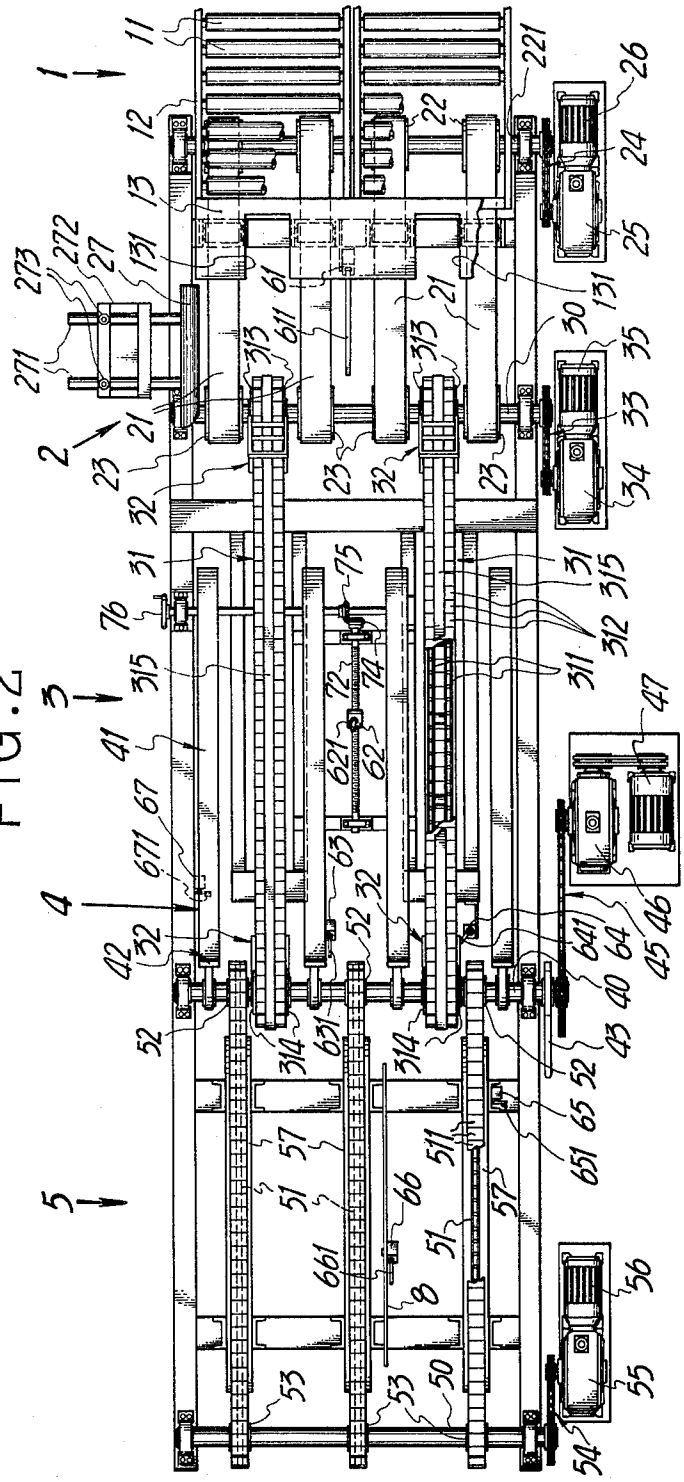
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FIG. 4

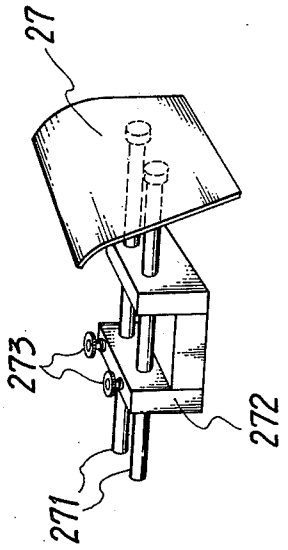


FIG. 5

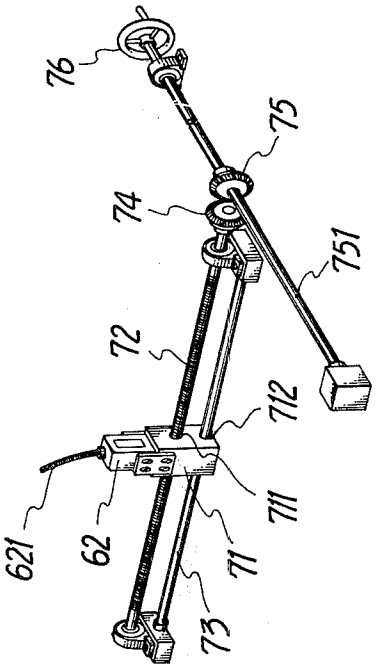


FIG. 3

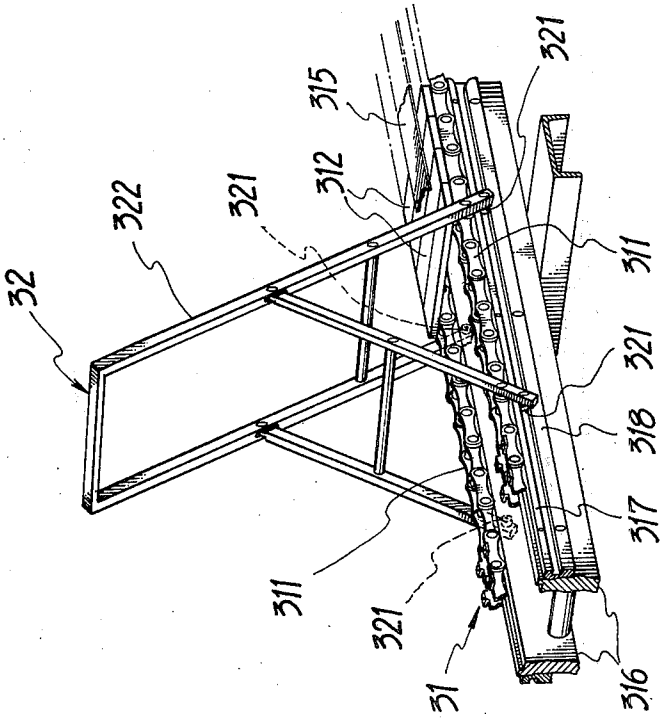
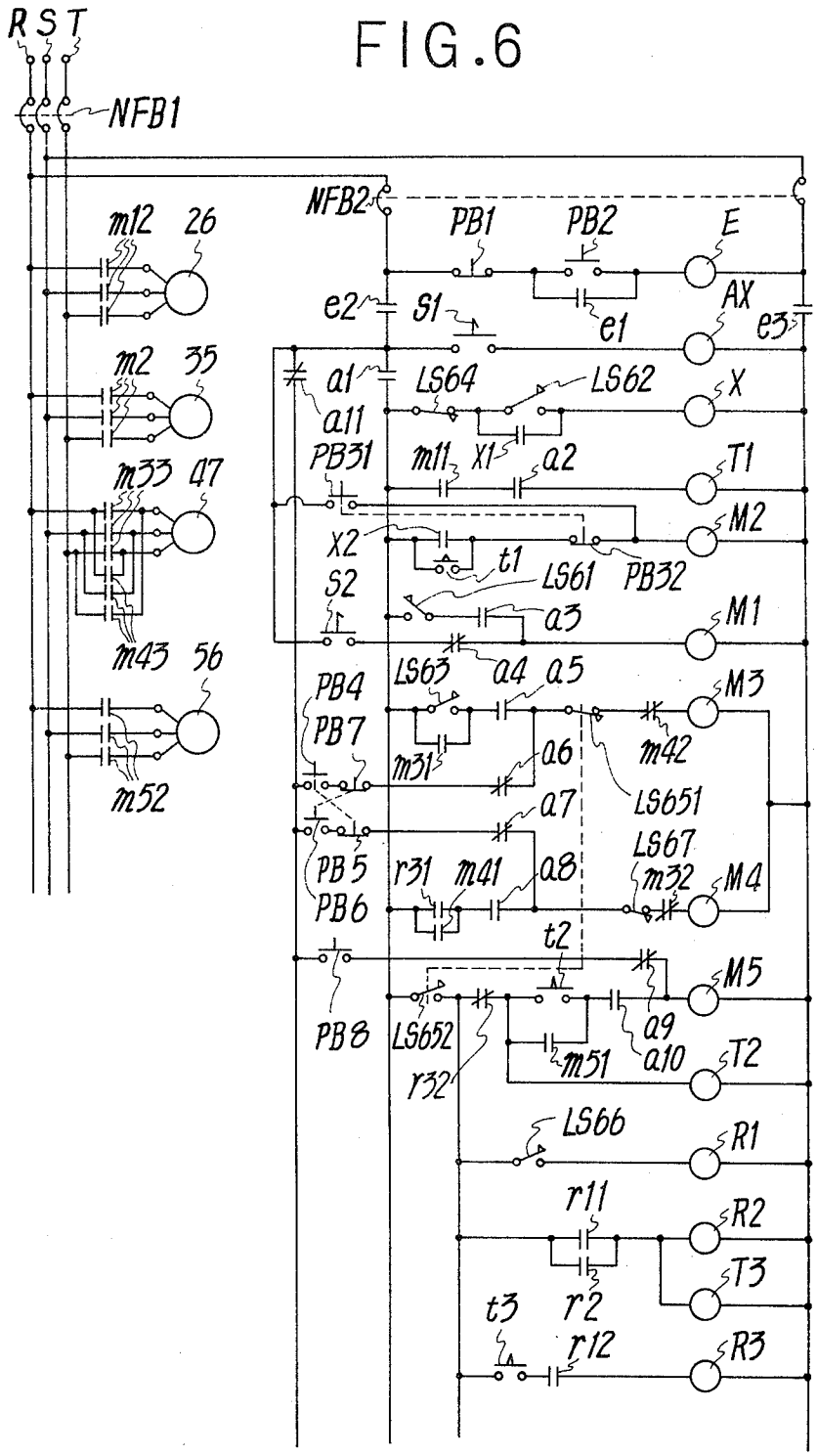


FIG.6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NFB1
NFB2
m12 26
m2 35
m33 47
m43 56
m52
PB1
PB2
E
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S1
e1
AX
e3
a1
LS64
LS62
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a11
PB31
m11
X1
a2
T1
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APPARATUS FOR PILING BOARDS

BACKGROUND AND SUMMARY OF THE INVENTION

The present invention relates to a board piling up apparatus which can stack, to a desired height, the boards such as corrugated boards, pasteboards, cardboards, etc..

Conventionally this type of operation for piling up the boards or small stacks thereof which are successively fed slowly lying flatly, has been perfomed manually. Accordingly, the operation has been highly inefficient and thus it has been difficult to pile up these boards to a desired height.

An object of the present invention is to provide a board piling up apparatus wherein the boards or their small blocks which are successively fed at a high speed, lying flatly are quickly stacked into a desired comparatively high position and the stacked boards are sequentially discharged.

Other objects of the present invention will become apparent from the following full description of the present invention in conjunction with preferred embodiments thereof and with particular reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only, and thus are not limitative of the present invention and wherein,

FIG. 1 is a side view of an apparatus, in accordance with the present invention, wherein several parts thereof are removed or broken away so as to clearly illustrate the entire apparatus of the present invention, and the position of the driving means portion thereof on each conveyer is displaced,

FIG. 2 is a plan of the apparatus, in accordance with the present invention, wherein several parts thereof are removed or broken away so as to clearly illustrate the entire apparatus of the present invention,

FIG. 3 is a slant face view showing how a board reclining support is provided on the chain conveyer with slats,

FIG. 4 is a slant face view of an alignment plate,

FIG. 5 is a slant face view showing a mechanism for adjusting the position of a limit switch which determines the piling up height of the boards, and

FIG. 6 is a view showing an electric control circuit of the apparatus in accordance with the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to FIGS. 1 and 2, the board piling up apparatus is composed of a vertically erecting conveyer 2 which receives the boards from a feeding conveyer 1, a transporting conveyer 3, a reversing gear 4 and a discharging conveyer 5.

The feeding conveyer 1 is such that several rollers 11, which are arranged approximately in parallel are rotatably provided on a roller supporting frame 12, and a guiding plate 13 is projected to the end of the frame 12. Notches 131 and 131 through which board reclining supports 32, (later described) can pass are provided in the guiding plate 13. The guiding plate 13 is composed of an approximately horizontal portion, and a portion which extends downwardly, being curved from the horizontal portion.

The vertically erecting conveyer 2 is a belt conveyer whose transporting face bends downwardly from below the tip end of the guiding plate 13 on the feeding conveyor 1. The erecting conveyer 2 has several comparatively short endless belts 21, arranged in parallel at proper intervals, and is entrained around feeding end pulleys 22, and discharging end pulleys 23,. The feeding end pulleys 22, are secured to a shaft 221, which is driven, through a proper chain transmission gear 24 and a speed change gear 25, by a motor 26.

The discharging end pulleys 23, are rotatably engaged with a shaft 30. An alignment plate 27 is arranged on the exterior side of the vertically erecting conveyer 2. The alignment plate 27 is curved as shown in FIG. 4, and rods 271 and 271 project from on the back face of the alignment face 27. These rods 271 and 271 are engaged with a support 272 so as to slide across the feeding direction of the vertically erecting conveyer 2 and may be secured by a proper setscrew 273 which is spirally engaged with the support 272.

The transporting conveyer 3 is composed of a pair of chain conveyers 31 and 31 with slats which extend almost horizontally from the discharging end of the vertically erecting conveyer 2, and board reclining supports 32, which are supported by a pair of arms which engage with each chain conveyer 31. Each chain conveyer 31 with slats has a slat 312 bridged fixedly to the respective mating chain links of the parallel endless chains 311 and 311. The endless chains 311 and 311 of each chain conveyer 31 with slats are entrained around the feeding end sprockets 313 and 313, and the discharging end sprockets 314 and 314. The feeding end sprockets 313 and 313 of each chain conveyer 31 with slats are secured to a shaft 30 with which the discharging end pulleys 23, of the vertically erecting conveyer 2 are engaged, while the discharging end sprockets 314 and 314 are rotatably engaged with the shaft 40. A strap member 315 made of a flexible material is provided on the slats 312, of each chain conveyer 31 thereby preventing the boards from being inserted between the slats 312 and 312 and from sliding on the slats 312,. The shaft 30 to which the feeding end sprockets 313, are secured is driven, through a proper chain transmission gear 33 and a speed change gear 34, by a motor 35.

A proper chain supporing member 316 is provided under the transporting side portion of each chain 311 on each conveyor 31 thereby supporting the chain 311. Two board reclining supports 32 and 32 provided on each chain conveyer 31 with slats are mounted on the chains 311 and 311 at an interval, which is almost one half of the overall circumferential length of the chain 311. The two board reclining supports 32 and 32 are arranged, in a direction across the conveyer feeding direction, in said pair of chain conveyers 31 and 31.

As shown in FIG. 3, the mounting operation of each board reclining support 32 into a chain 311 is conducted by engaging the lower end of the board reclining support 32 with a chain pin. Four small wheels 321, are rotatably mounted at the lowest end of each board reclining support 32. When the board reclining support 32 provided with four small wheels is placed on the chain conveyer 31, each small wheel 321 is engaged between the upper and lower guiding rods 317 and 318, which are secured to the side face of each chain sup-

porting member 316 and rolls into contact with any one of the guiding rods, thereby stabilizing the board reclining support 32. When the board reclining support 32 is placed on the chain conveyer 31, an object supporting portion 322 (see FIG. 3) for the board reclining support 32 is erected, with a forwardly tilting posture in the conveyer feeding direction. The feeding speed of the transporting conveyer 3 is almost as fast as that of the vertically erecting conveyer 2. The reversing gear 4 is composed of a board erecting base 41 which appears and disappears from the surface of the transporting conveyer 3, and a board piling up base 42 which appears and disappears from the surface of the discharging conveyer 5 (later described). The board erecting base 41 is fork-shaped and its length is longer than the piling up height "H" (see FIG. 1) of the boards stacked by the apparatus of the present invention. The one side end 411 thereof is fixedly secured to a shaft 40 with which the discharging end sprockets 314, of the transporting conveyer 3 are engaged. The board piling up base 42 is also fork-shaped and extends at almost a right angle to the base 41 from the one side end 411 of the board erecting base 41. A fan-shaped gear 43 is secured to the end of the shaft 40 and a pinion gear 44 is engaged with the gear 43. The pinion gear 44 is driven, through a chain transmission gear 45 and a speed change gear 46, by a motor 47. The interlocking condition between the fan-shaped gear 43 and the pinion gear 44 is set to allow the rotation from a posture, where the board erecting base 41 is recessed from the transporting conveyer 3 through the rotation of the pinion gear 44, to an approximately vertical posture. and simultaneously from approximately a vertical posture to a posture wherein the board piling up base 42 is recessed into the discharging conveyer 5 (later described) through the rotating action of the base 41. The discharging conveyer 5 is a chain conveyer with slats which extends almost horizontally from the discharging end on the transporting conveyer 3 and has three endless chains 51, 51 and 51 with slats 511, arranged in parallel in proper intervals. The discharging conveyer 5 is entrained around the feeding end sprockets 52, 52 and 52, and around the discharging end sprockets 53, 53 and 53. The feeding end sprockets 52, 52 and 52 are rotatably engaged with the shaft 40, while the discharging end sprockets 53, 53 and 53 are secured to the shaft 50. The shaft 50 is driven, through a proper chain transmission gear 54 and a speed change gear 55, by a motor 56. A proper chain supporting member 57 is provided below the transporting side portion of each endless chain 51 thereby supporting the chain 51.

A limit switch for rotating and suspending the motor, which drives each of said conveyors, at a proper time is arranged as follows.

The limit switch 61 is provided between the endless belts 21 and 21 on the vertically erecting conveyer 2. The starting member 611 for the limit switch 61 is composed of a curved leaf spring and is provided on the vertically erecting conveyer 2. A limit switch 62 is placed between the chain conveyers 31 and 31 with slats on the transporting conveyer 2, and placed so as not to interfere with the reversing gear 4. As shown in FIG. 5, the switch 62 is secured to a switch supporting member 71 which is provided with a female tapped hole 711 and a notched groove 712, and a starting member 621, which is in the form of a rod-shaped helical spring, is provided on the transporting conveyer 3. The female tapped hole 711 of the switch supporting member 71 is spirally engaged with the screw rod 72 which is rotatably provided in parallel with the feeding direction of the transporting conveyer 3. The notched groove 712 is slidably engaged with the guiding rod 73 which is parallel to the screw rod 72. A bevel gear 74 is secured to the end of the screw rod 72 and another bevel gear 75 which is secured to a gear shaft 751 is interlocked with the bevel gear 74. The bevel gear 75 is rotated by operating a handle 76 which is secured to the shaft 751. A limit switch 63 is secured, in a place near a shaft 40, to the board erecting base 41 on the reversing gear 4, and its starting member 631 is provided on the board erecting base 41. A limit switch 64 is placed in the lower portion of the discharging end of the transporting conveyer 3. The starting member 641 of the switch 64 is provided on a passage for the board reclining supports 32 and 32, and is pushed by the other board reclining support 32 when one board reclining support 32, which is located at the feeding end of the transporting conveyer 3, is positioned in a place for receiving the first board which is fed from the feeding conveyer 1. A limit switch 65 is placed on the side of the discharging conveyer 5, and its starting member 651 is pushed by the board piling up base 42 of the reversing gear 4 which is recessed from the discharging conveyer 5. A limit switch 66 is slidably engaged with a long hole 81 of a switch supporting rod 8 which is provided, facing the conveyer feeding direction, between the endless chains 51 and 51 on the discharging conveyer 5. The starting member 661 of the switch 66 is provided on the discharging conveyer 5. A limit switch 67 is placed on the side of the transporting conveyer 3, and its starting member 671 is pushed by the board erecting stand 41 of the reversing gear 4 which is recessed from the transporting conveyer 3.

In FIG. 6 are shown electric control circuits of the apparatus in accordance with the present invention. Referring now to FIG. 6, a terminal R.S.T. is one for threephase AC power source connections. NFB1 and NFB2 respectively show a breaker. A contact m12 is a normally open contact (hereinafter referred to as A contact) for an electromagnetic contactor M1 which drives and controls a motor 26 of the erecting conveyer 2. A contact m2 is an A contact for an electromagnetic contactor M2 which drives and controls a motor 35 of the transporting conveyer 3. Contacts m33 and m43 are respectively an A contact for a normally rotating electomagnetic contactor M3 and a reversely rotating electromagnetic contactor M4, which drive and control a motor 47 of the reversing gear 4. A contact m52 is an A contact for an electromagnetic contactor M5 which drives and controls a motor 56 of the discharging conveyer 5. Switches PB1, PB32, PB5 and PB7 are normally closed-circuit type of push button switches which are opened respectively only when the buttons are in a depressed position and are closed immediately when the buttons are released. Switches PB2, PB31, PB4, PB6 and PB8 are normally open circuit type of push button switches which are closed respectively only when their buttons are in depressed position and are opened immediately when the buttons are released. Switches S1 and S2 are respectively alternate types of switches which are provided with a contact mechanism which retains the condition, once it is set until an opposite action is taken. Switch PB31, switch PB4 and switch PB6 operatively cooperate with switch PB32,

switch PB5 and switch PB7 respectively. Contacts *e*1, *e*2 and *e*3 are respectively an A contact for a relay E. Contacts *a*1, *a*2, *a*3, *a*5, *a*8 and *a*10 are respectively an A contact for a relay AX, which contacts *a*4, *a*6, *a*7, *a*9 and all are respectively a normally closed contact (hereinafter referred to as B contact) for the relay AX. Contacts X1 and X2 are respectively an A contact for a relay X. A contact m11 is an auxiliary A contact for the electromagnetic contactor M1, and contacts *m*31 and *m*32 are respectively an auxiliary A contact and an auxiliary B contact for the electromagnetic contactor M3. Contacts *m*41 and *m*42 are respectively an auxiliary A contact and an auxiliary B contact for the electromagnetic contactor M4. A contact *m*51 is an auxiliary A contact for the electromagnetic contactor M5. A contact *t*1 is a delay A contact for a timer relay T1, contact *t*2 is a delay A contact for a timer relay T2, and contact *t*3 is a delay A contact for a timer relay T3. Contacts *r*11 and *r*12 are respectively an A contact and a B contact for a relay R1. A contact r2 is an A contact for a relay R2, while contacts *r*31 and *r*32 are respectively an A contact and a B contact for a relay R3. LS61 is an A contact for a limit switch 61, LS62 is an A contact for a limit switch 62, LS63 is an A contact for a limit switch 63 and, LS64 is a B contact for a limit switch 64. LS651 and LS652 are respectively a B contact and an A contact for a limit switch 65 and cooperate operatively with each other. LS66 is an A contact for a limit switch 66, and LS67 is a B contact for a limit switch 67.

Described hereinafter is the board piling operation of the present invention wherein board blocks are formed by stacking a plurality of boards piled up by the apparatus described hereinabove. As a preliminary operation, the switch supporting member 71 and the limit switch 62 are moved in the feeding direction of the transporting conveyer 3 by rotating a handle 76 thereby setting the position of the switch 62 in accordance with the desired height for piling up the boards. Also, the limit switch 66 is slide along a long hole 81 of the switch supporting rod 8 to fixedly secure it in a given position. The given location for the switch 66 is a place where the board blocks 9, pass the switch 66 when the board blocks 9, which are fed for the discharging end of the discharging conveyer 5, have reached the discharging end. In addition, one board reclining support 32 is placed in the feeding end of the transporting conveyer 3, while the other board reclining support 32 is put into a condition where the starting member 641 of the limit switch 64 is pushed. Then, a preparation push botton switch PB2 is pushed, as shown in FIG. 5, to excite a relay E thereby causing A contacts *e*1, *e*2 and *e*3 to be closed. Also, an automatic change-over switch S1 is closed and the relay AX is excited. Accordingly, A contacts *a*1, *a*2, *a*3, *a*5, *a*8 and *a*10 are closed, while B contacts *a*4, *a*6, *a*7, *a*9 are all opened. After such preparing operation has been completed, the board blocks 9 which are fed from the front process (not shown) and lying in a flat position are slid down at a fast speed from the feeding conveyor 1 to the erecting conveyor 2. Then, the board blocks or stacks 9 are raised up respectively through the rotating movement of the rear end thereof with the front end thereof in contact with the conveyor 2 as a base point, and, are reclined against the board reclining support 32. Then, the starting member 611 of the limit switch 61, which is provided on the erecting conveyer 2, is pushed by the board block thereby closing the contact LS61 of the switch 61. Accordingly, the electromagnetic contactor M1 is excited and the contact m12 is closed. Current is applied to the motor 26 which begins to drive the erecting conveyer 2. Thus, the front end of the board block 9 which has come into contact with the erecting conveyor 2 is transported to the board reclining support 32, while an operator who stays outside of the erecting conveyor 2 erects the board block 9 and aligns the board block 9 against an alignment plate 27 provided on the opposite exterior side of of the erecting conveyor 2. When the board blocks 9 have been reclined closely against the board reclining support 32, the delay A contact t1 for a timer relay T1, which has begun to count upon closure of the contact LS61 of the limit switch 61, is closed thereby exciting the electromagnetic contactor M2. Thus, the contact m2 is closed thereby causing the current to be apply to the motor 35, whereby the transporting conveyer 3 begins to operate. As the board block 9 leaves from the starting member 611 of the switch 61 upon the rotation of the transporting conveyer 3, the contact LS61 of the switch 61 is opened thereby suspending the erecting conveyer 2 and the transporting conveyer 3. Accordingly, as the board blocks 9, which are fed by the feeding conveyor 1 are sequentially erected and reclined against the board blocks 9, the transporting conveyor 3 repeats its movement. Accordingly, the board reclining support 32 advances intermittently. Thus, when a given number of board blocks 9, have been erected on the transporting conveyer 3, the first board block 9 reaches the starting member 621 of the limit switch 62 thereby pushing it. The contact LS62 of the switch 62 is closed and the relay X is excited thereby closing the contacts X1 and X2. The electromagnetic contactor M2 is excited upon closure of the contact X2 thereby successively starting the operation of the transporting conveyer 3. Since the first board block 9 reaches the starting member 631 of the limit switch 63 thereby pushing it right before reaching the discharging end of the transporting conveyer 3 by the sucessive operation of the transporting conveyer 3, the contact LS63 of the switch 63 is closed thereby exciting the electromagnetic contactor M3 and thus the contacts m31 and m33 are closed. Current is applied to the motor 47 upon closure of the contact m33 and the reversing gear 4 starts to normally rotate (counterclockwise in FIG. 1). When the board erecting base 41 of the reversing gear 4 has shown up on the transporting conveyer 3, the board blocks 9, are already on the base 41, and are piled up on the board piling up base 42 by the rotation of the reversing gear 4. Since one board reclining support 32, against which the board blocks 9, have been reclined during the rotating movement of the reversing gear 4, reaches the starting member 641 of the limit switch 64 thereby pushing it, the contact LS64 of the switch 64 is opened thereby deenergizing the relay X, and the contacts X1 and X2 are opened. Upon opening of the contact X2, the electromagnetic contactor M2 is deenergized and the transporting conveyer 3 is suspeneded. When the conveyer 3 has been suspened as described hereinabove, the other board reclining support 32 is located in the feeding end of the conveyer 3 and is prepared for the subsequent piling up operation. The board blocks 9, which have been piled up on the board piling up base 42 by the rotating motion of the reversing gear 4 are placed

on the discharging coveyer 5 by recessing the base 42 from the descharging conveyer 5.

The base 42 is recessed from the conveyer 5 and reaches the starting member 651 of the limit switch 65 thereby pushing it. Then, the B contact of the switch 65 is opened and simultaneously the A contact LS652 is closed. Since the electromagnetic contactor M3 is deenergized by opening the contact LS651, the reversing conveyer 4 is suspeneded. Also, the delay contact t2 of the timer relay T2 which has begun to count upon closure of the contact LS652 is closed after the board blocks 9, which were placed on the discharging conveyer 5 have been stabilized. Since the electromagnetic contactor M5 is excited upon closure of the contact t2, the contacts *m*51 and *m*52 are closed. Accordingly, current is applied to the motor 56 to cause the discharging conveyer 5 to operate. Accordingly, the stacked board blocks 9, are fed to the discharging end of the conveyer 5. The board blocks push the starting member 661 of the limit switch 66 on the way to the discharging end thereof and close the contact LS66 of the switch 66. As the relay R1 is excited by closure of the contact LS66, the contact r11 is closed and the contact r12 is opened. The relay R2 is excited for self-holding by the closure of the contact r11. When the board blocks 9, have reached the discharging end on the discharging conveyer 5 and have past the limit switch 66, the delay contact t3 of the timer relay T3, which has started to count upon the excitation of the relay R2, is closed. Accordingly, the contact LS66 of the limit switch 66 is opened at this time, and the relay R1 is deenergized. Thus, the contact *r*12 is closed and the relay R3 is excited. Excitation of the relay R3 closes the contact *r*32 thereby deenergizing the electromagnetic contacter M5. Thus, the discharging conveyer 5 is suspended and the contact *r*31 is closed thereby exciting the electromagnetic contactor M4. The contact *m*43 is closed upon excitation of the electromagnetic contactor M4 and thus the current is applied to the motor 47 causing the reversing gear 4 to start to rotate reversely. When the board erecting base 41 of the reversing gear 4 is recessed from the transporting conveyer 3 thereby pushing the starting member 671 of the limit switch 67 to open the contact LS67 of the switch 67, the electromagnetic contactor M4 is deenergized thereby suspending the reversing conveyer 4 for the subsequent operation.

Thus the board blocks are quickly piled up into a desired height, and the stacked board blocks are sequentially descharged. Furthermore, by pushing the switch PB31 while the operation is performed, the electromagnetic contactor M2 is excited in spite opening and closing of the contacts X2 and t1, and thus the transporting conveyer 3 is operated. Also, the electromagnetic contact M1 is excited by closing the switch S2 when the switch S1 is in an opened position, and the erecting conveyer 2 is operated. By depressing the switch PB4, when the switch S1 is in opened position, the electromagnetic contactor M3 is excited, if the B contact LS651 of the limit switch 65 is in a closed position while the switch PB4 is continually being pushed, whereby the reversing gear 4 is normally rotated. By depressing the switch PB6, the electromagnetic contactor M4 is excited, if the B contact LS67 of the limit switch 67 is in a closed position, while the switch PB6 is continually being pushed, whereby the reversing gear 4 is rotated reversely. Furthermore, by depressing the switch PB8 when the switch S1 is in an open position, the electromagnetic contactor M5 is excited, and thus the discharging conveyer 5 is operated. By depressing an emergency stop switch PB1, the relay E is deenergized and the contacts *e*3 and *e*3 are opened. Since feeding is suspended to of the entire control circuits, all the conveyers are suspended.

The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications are intended to be included within the scope of the following claims.

What is claimed is:

1. An apparatus for stacking boards to a predetermined height which comprises, in combination, a feeding conveyor for successively introducing boards lying flat on said conveyor to the apparatus, vertically erecting conveyor means on which the boards are erected, extending downwardly from the feeding conveyor, a transporting conveyor for receiving and transporting the erected boards to the discharge end thereof, said transporting conveyor being provided with a board reclining support associated therewith near the end portion of the erecting conveyor for receiving and holding the boards while they are being conveyed on the transporting conveyor, a discharge conveyor for removing the boards from the transporting conveyor, a reversing gear comprising an L-shaped member rotatably disposed about the discharge end portion of the transporting conveyor, said L-shaped member containing a board erecting base and a board piling up base disposed at substantially right angles with respect to each other and adapted to be operatively cooperative with each other, said board erecting base being rotatable from a recessed position below the transporting conveyor to a substantially vertical position and said board piling up base being simultaneously rotatable from a substantially vertical position to a recessed position below the discharge conveyor, and means for rotating the board erecting base and the board piling up base.

2. The apparatus of claim 1, wherein the vertically erecting conveyor means comprises conveyor belts which extend from the feeding conveyor downwardly to the transporting conveyor.

3. The apparatus of claim 1, wherein an alignment plate is disposed along the side of the erecting conveyor and exterior thereto, said plate being movable in a direction perpendicular to the direction of travel of the erecting conveyor for aligning the edges of the vertically disposed boards.

4. The apparatus of claim 1, wherein the discharge conveyor comprises substantially horizontally disposed endless conveyor belts which are arranged to allow the board piling up base of the reversing gear to be recessed below the conveyor belts, the feeding end of the discharge conveyor being closely associated with the discharge end of the transporting conveyor.

5. The apparatus of claim 1, wherein means are provided for rotating the feeding conveyor, for rotating the vertically erecting conveyor, for rotating the transporting conveyor and for rotating the discharge conveyor.

6. The apparatus of claim 1, wherein more than one board reclining support is associated with the transporting conveyor.

7. An apparatus for stacking boards which are successively fed to said apparatus individually or in small

stacks and in a flat position which comprises a feeding conveyor including a roller conveyor capable of feeding the boards or stacks of boards as they are lying in said flat position, an erecting conveyor on which the boards are erected including endless transporting belts provided in parallel relationship, said transporting belts containing transporting faces which are downwardly inclined, one end of said belt being disposed under the discharge end of the feeding conveyor so that the individual boards or small stacks thereof may be raised by dropping from the feeding conveyor onto the erecting conveyor, a transporting conveyor having endless transporting belts provided in parallel relationship, the feeding end thereof being engaged with the discharging end of the erecting conveyor so that the boards or the stacks thereof in the raised-up position on the transporting surface of the erecting conveyor may be received and transferred in said raised position, said transporting belts containing board reclining supports fixed thereto, said reclining supports comprising an object supporting member slightly inclined towards the direction of transportation, a reversing gear having a fork-shape board erecting and aligning base, and a fork-shape board piling-up stand connected thereto so as to form an L-shape reversing gear, said reversing gear being rotatably connected to the discharge end of the transporting conveyor at the point where the board erecting base connects with the board piling-up stand, said board erecting and aligning base being arranged with the transporting conveyor so that the boards or the stacks of boards being transported to the discharging end of the transporting conveyor may be scooped up and rotated approximately 90° to stack the boards on the piling-up stand and a discharge conveyor having endless transporting belt, the feeding ends of said transporting belt being engaged with the discharging end of the transporting conveyor so that the boards stacked by the reversing gear may be received and transported, said board piling-up base and said discharge conveyor being in parallel relationship so that the board piling-up base may be recessed below the face of the discharge conveyor.

8. The apparatus of claim **7**, wherein a plurality of board reclining supports are associated with the transporting conveyor, said board reclining support being provided with wheels which engage guide rods which are attached to said transporting conveyor, said board reclining supports being continually conveyed from the discharge end to the feed end of the transporting conveyor by the reversing portion of said conveyor.

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