Dec. 19, 1961 H. W. LAMB 3,013,671

MACHINE FOR STACKING TILE AND THE LIKE

Filed April 3, 1959 3 Sheets-Sheet 1

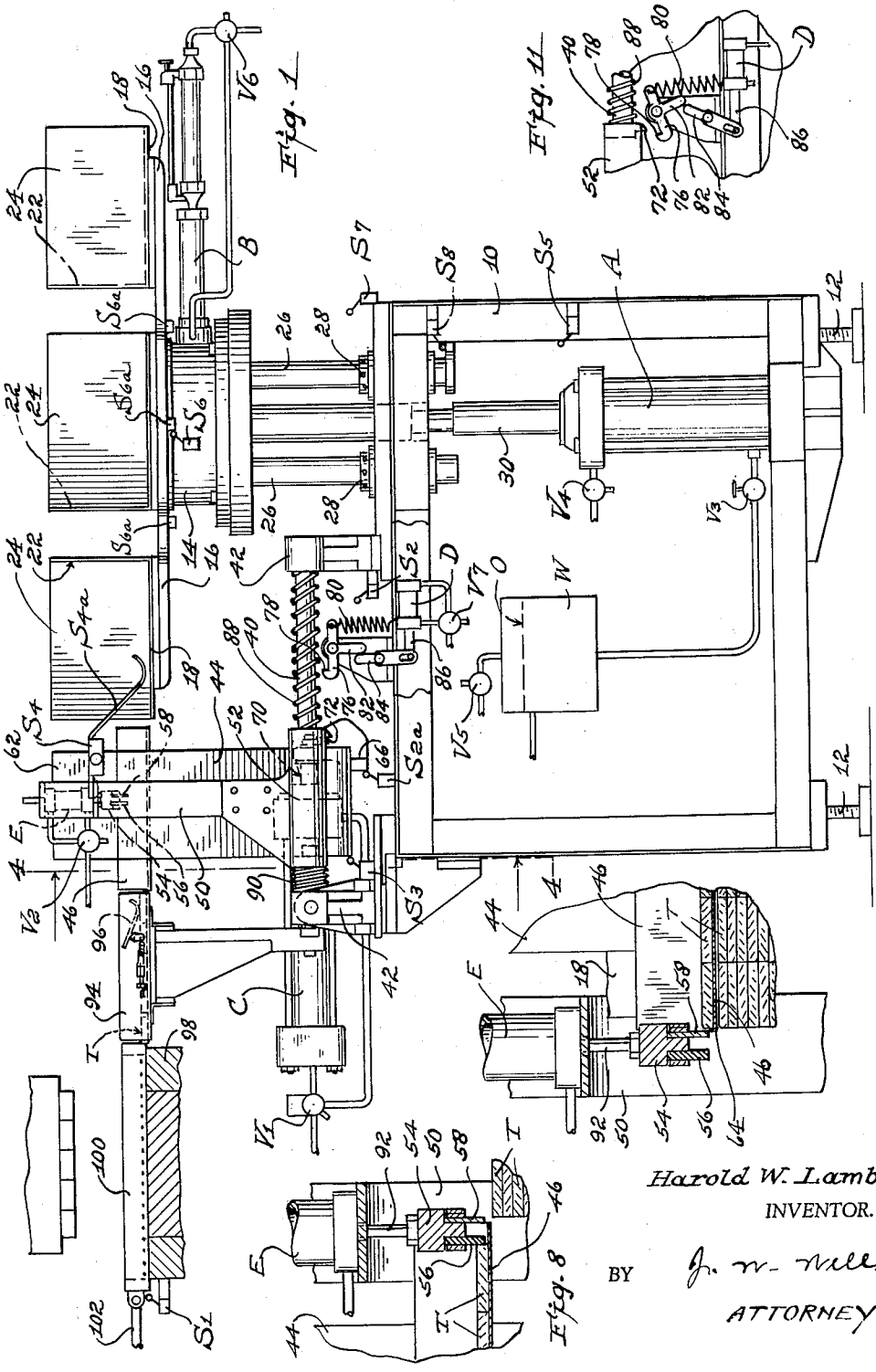


Fig. 1

Fig. 11

Fig. 10

Fig. 8

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MACHINE FOR STACKING TILE AND THE LIKE

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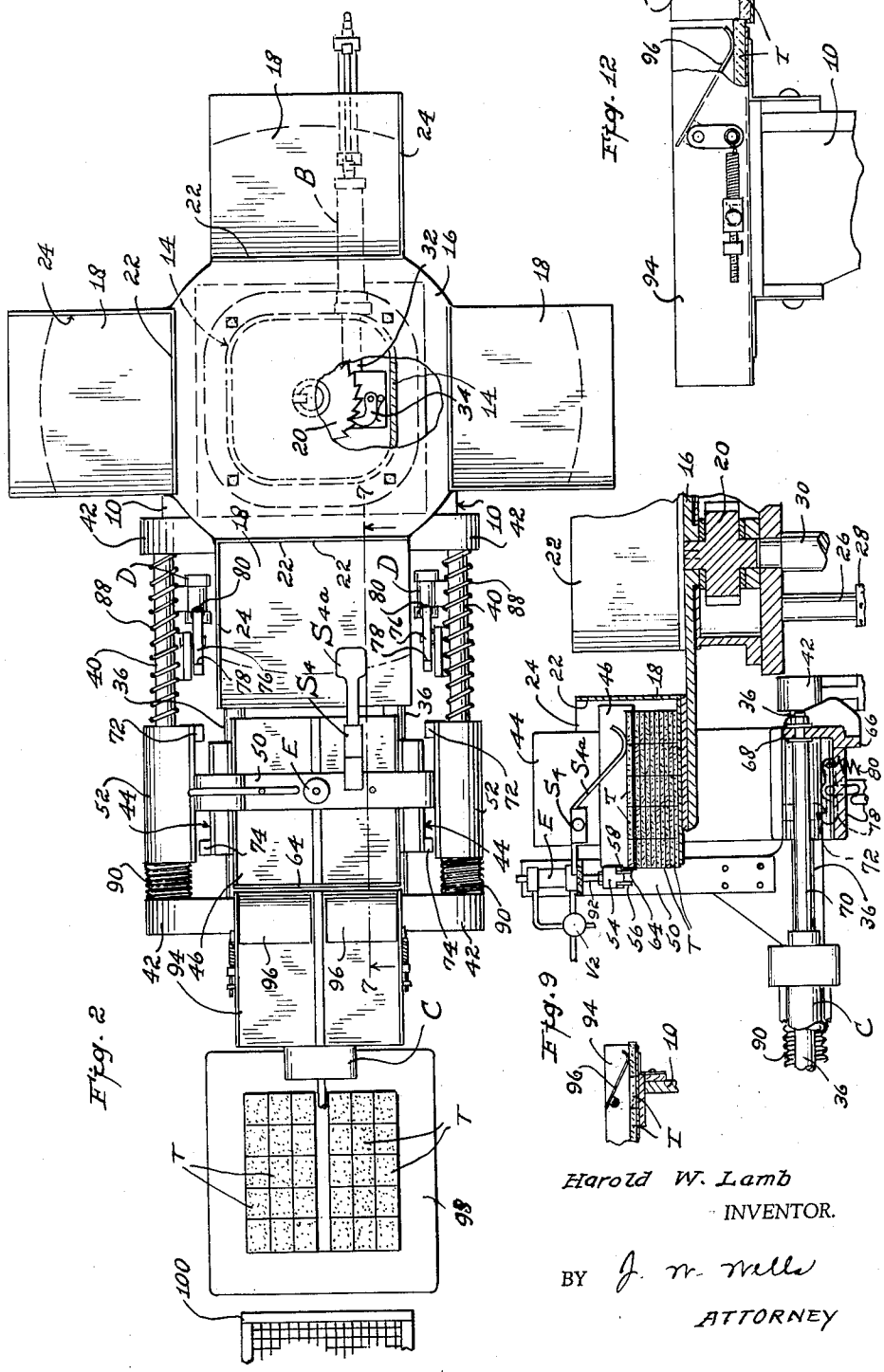


Fig. 2

Fig. 12

Fig. 9

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MACHINE FOR STACKING TILE AND THE LIKE

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Fig. 4

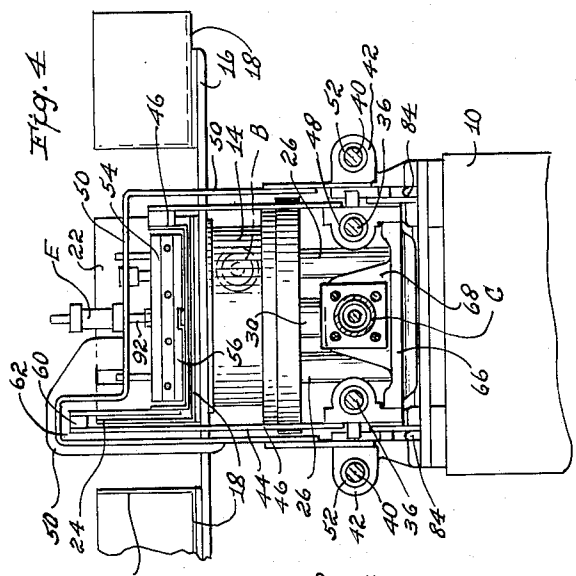


Fig. 7

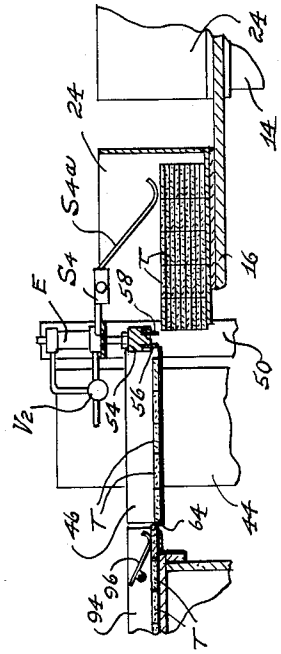


Fig. 5

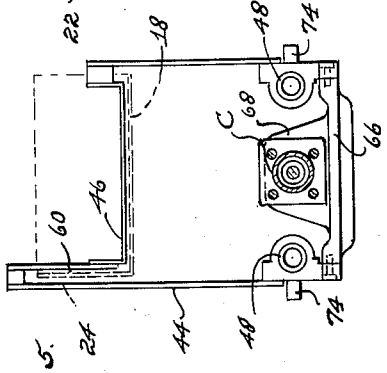


Fig. 6

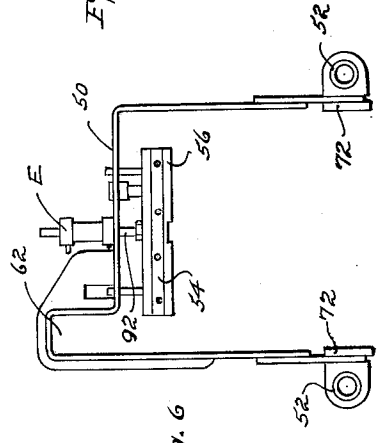
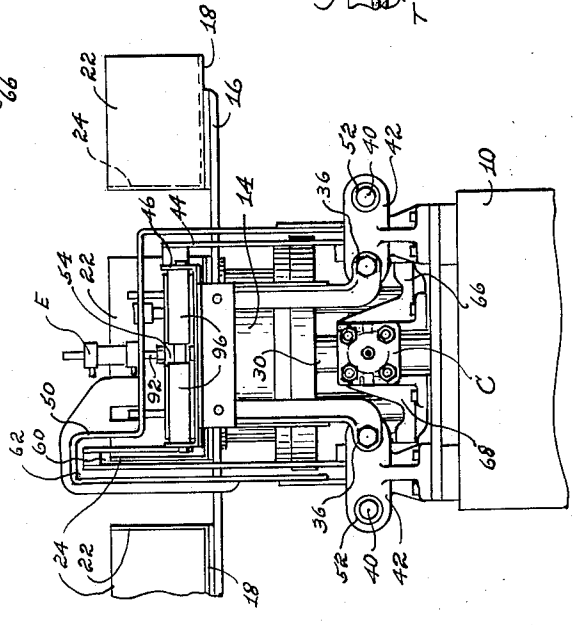


Fig. 3



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United States Patent Office 3,013,671
Patented Dec. 19, 1961

3,013,671

MACHINE FOR STACKING TILE AND THE LIKE

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Filed Apr. 3, 1959, Ser. No. 804,009
15 Claims. (Cl. 214—6)

This invention relates to apparatus for stacking flat plates or sheets, and one of the principal objects of the present invention is to provide an efficient machine for automatically stacking a predetermined number of tile as produced in continuous succession in a tile press, and moving the completed stacks to a location for convenient removal from the machine, thereby dispensing with the necessity of manual stacking and counting of the tile produced by the press. However, the machine is adaptable for stacking flat plates or sheets of any kind, size or thickness.

Modern tile presses are designed to produce batches of several tile in each die operation, and since many tile are produced in small sizes it has heretofore been difficult to remove the tile from the press and stack them in an orderly manner for kiln processing and other handling.

A further object of my invention is to provide a tile stacking machine for use in cooperation with a tile press, the tile produced by the press being slidably pushed from the top surface of the press die, through flat bottomed troughs, by the conventional clay dust tray, which conveys clay dust to the die, onto one of several circumferentially arranged trays placed on a vertically movable and rotatable platform. Through conventional electrically and fluid controlled actuating elements in cooperation with the various layers of tile deposited on the platform trays, the platform is lowered in step by step movements, corresponding to the thickness of the tile, during the stacking operations. After each stack is completed the platform is automatically lowered a short distance to clear obstructions on the machine, then rotated to bring an empty tray into frontal relation with the tile press and raised to its upper starting plane.

Another important feature of my improved machine is a horizontally movable tile carrying yoke, or frame, having thereon a tile carrying trough for carrying tile from a certain position to which it is pushed and depositing it on the tray in the process of stacking. A horizontally movable wiper yoke is mounted in cooperative, relatively movable relation with the tile carrying yoke and is provided with a pair of wiper blades, one being of soft resilient material for engagement with the front ends of a layer of tile to align the ends of any individual tile which become disarranged in transit toward the stacking tray upon withdrawal therefrom of the tile carrying trough.

Although in the operation of the present embodiment of my improved machine I employ air or other fluid pressure cylinders controlled by special electrical valves of conventional types, other suitable means may be employed for effecting cooperative movement of the various parts of the machine.

It is within the scope of my invention to unstack plates or sheets from the platform while at the same time maintaining the surface of the top sheet in a stack at the same height as the sheets are removed singly therefrom. The means for effecting step by step vertical movement of the platform would in the reverse arrangement mentioned be designed to raise the platform corresponding to the thickness of a sheet as each sheet is removed from a stack. Such a modified form of the invention is of particular advantage and convenience in the unloading of heavy hides or metal sheets from a pallet, for example.

Other objects and advantages of my invention will appear or be pointed out in the following specification in which reference is had to the accompanying drawings forming a part thereof, in which:

FIG. 1 is a side elevation showing one embodiment of a tile stacking machine in accordance with my invention, certain control valves and electrical actuating switches being indicated in schematic form, also the near side of the base enclosure being removed to show the interior parts; and also showing a tile press die and clay dust tray;

FIG. 2 is a top plan view of the machine shown in FIG. 1;

FIG. 3 is a rear elevation of the machine with the bottom portion of the base broken away;

FIG. 4 is a section taken on the line 4—4 of FIG. 1, as looking toward the front of the machine;

FIG. 5 is a rear view of the tile carrying yoke;

FIG. 6 is a rear view of the wiper yoke;

FIG. 7 is a detailed sectional view, taken on the line 7—7 of FIG. 2, showing a stack of tile partially completed, with the wiper yoke, together with the wiper, in its extreme forward, latched position and with the tile carrying yoke in its rearward starting position immediately after a layer of tile has been pushed into the tile carrying trough, with the front end of the layer slightly short of the soft resilient wiper blade on the wiper yoke;

FIG. 8 is an enlarged detail section showing the tile carrying tray moved slightly forward from its position as shown in FIG. 7, thereby bringing the layer of tile in the trough into abutting relation with the soft wiper blade for alignment of disarranged tile in the layer;

FIG. 9 is a sectional view similar to FIG. 7, showing both yokes in their extreme forward positions with a layer of tile ready to be deposited on the stack;

FIG. 10 is an enlarged detail view, more clearly showing the metal wiper blade in position to prevent backward displacement of the tile from the stack as the tile carrying yoke is withdrawn toward its rearward starting position;

FIG. 11 is a detail view showing the manner of release of the wiper yoke latching means, shown in FIGS. 1, 2 and 9; and

FIG. 12 is a side elevation, partly in section, showing an auxiliary trough through which the layers of tile are pushed into the tile carrying trough by the clay dust tray of the tile press.

As already mentioned, in the embodiment of my improved tile stacking machine as illustrated, I employ air or other fluid pressure operated cylinders controlled by electrically operated valves and electrical switches all of conventional design arranged for proper actuation of the cylinders in sequential order to accomplish the desired purpose of the machine, and such cylinders and their operating and control elements will be described in the following specification, notwithstanding that other suitable means may be substituted for those herein described.

Referring to the drawings in which like reference characters designate the same parts or elements in the several views, the machine, as illustrated, includes a base, which in the present embodiment is in the form of an inclosed frame 10 of sufficient height for convenience and provided with adjustable legs 12 for leveling the base. Upon the upper end of this base a platform support 14 is mounted for vertical but non-rotatable movement thereon. A platform 16 having placed about its periphery a plurality of equidistantly spaced rectilinear flat bottomed trays 18 is mounted on a ratchet wheel 20 rotatably mounted in the upper end of the support 14. Each of the trays 18 is provided with, at least a vertical back wall 22, as a means of lifting the tray from the platform, adapted to be rotated into frontal relation with

the tile carrying and wiper yokes, to receive the layers of tile T in the course of their stacking on the tray in position to receive them. The trays may each also be provided with a vertical side wall **24**.

The support **14** is held in vertically movable but in nonrotatable relation on the base **10** by a plurality of guide rods **26** projecting slidably through bearings **28** in the top of the base **10**. A piston rod **30** connects the platform support **14** with a hydropneumatic cylinder A for effecting back and forth vertical movement of the support **14** and associated platform **16**. A piston rod **32** (FIG. 2) having a pawl **34** in engagement with the ratchet wheel **20** (FIGS. 1 and 7) is connected with a horizontal air cylinder B for effecting rotation of the platform on the support **14**. The control valve arrangement and operation of the two cylinders mentioned will hereinafter be described.

A pair of rods **36** (FIGS. 2, 3, 4 and 7), or similar guides, is mounted longitudinally of the base **10** rearwardly of the platform **16** in transversely spaced, parallel relation, one on each side of the longitudinal center line of the base. A second pair of similar rods **40** is transversely spaced outwardly from the first pair, all of said rods being rigidly mounted in upright end supports **42**, on the base **10**. An arch-like yoke **44** having a horizontal top portion provided with a longitudinally extending, flat bottomed tile carrying trough **46** is mounted at its lower ends, through ball bearings **48**, on said first pair of rods **36** for longitudinal movement thereon toward and from said platform **16**. A second arch-like yoke **50**, of greater width than the yoke **44**, is mounted at its lower ends through ball bearings **52** on the second pair of rods **40** for longitudinal movement thereon. This second yoke **50** is provided at its upper end with a wiper member **54**, which may include one soft, resilient blade **56** rearwardly of the yoke for aligning the ends of tile T, as hereinafter described, and a metal blade **58**, forwardly of but closely adjacent to the other blade, for preventing backward displacement of individual layers of tile from the stack, also as hereinafter described, each of these blades being of the correct length to traverse the tile carrying trough **46** between its walls. The longitudinal length of the tile carrying yoke **44** is substantially greater than that of the wiper carrying yoke **50**. The tile carrying trough **46** is longer than the yoke and extends a short distance beyond its ends. The tile T is somewhat shorter than the trough **46** to provide for a short forward movement of the trough and tile for alignment of the front ends of the tile before being carried to the stack, as shown in FIGS. 7 and 8. In their initial rearward starting positions the tile carrying yoke lies within the other in freely telescopically movable relation, as shown in FIGS. 1 to 4.

The tile carrying yoke **44** is provided at its upper end on one side with an upwardly projecting loop **60** (FIGS. 3, 4 and 5) to receive the vertical side wall **24** of either of the trays **18**. The wiper yoke **50** is provided with a similar, but wider, loop **62** (FIGS. 3, 4, 5 and 6) adapted to telescope the other loop. The tile carrying trough **46** may be provided at its rear end with a shallow vertical ledge **64** (FIG. 10) adapted to abut the rear end of a layer of tile T pushed into the trough. A cross bar **66** (FIGS. 4, 5 and 9) having an upstanding projection **68** is attached at its ends to the opposed lower ends of the tile carrying yoke **44**. A piston rod **70** (FIG. 9) connects this projection with an air cylinder C, the operation of which will later herein be described.

The front inner walls of the wiper yoke **50** are provided with laterally projecting lugs **72** (FIGS. 2 and 6) in position to be abutted by similar lugs **74** (FIGS. 2 and 5) on the rear outer walls of the tile carrying yoke **44**, so that when the tile carrying yoke is moved toward the platform **16**, and after substantial relative lost motion, the lugs **74** on the tile carrying yoke will abut the lugs **72** on the front of the wiper yoke, after which the two yokes will move together to their extreme forward positions, where the wiper yoke will be automatically latched in stationary position by latch means including a pair of horizontal levers **76** pivoted intermediate of their ends to supports on the base **10**, these levers having at their rear ends shoulders **78** (FIGS. 1, 9 and 11) for engagement with the lugs **72** on the wiper yoke **50** and their front ends having springs **80** attached to the base **10** urging those ends of the levers downwardly and the shoulders **78** into engagement with the lugs **72**. The levers **76** also have depending legs **82** in engagement with the upper end portions of vertical levers **84**, pivoted intermediate of their ends to supports on the base. Piston rods **86** connect the levers **82** with air cylinders D, the purpose of which is to effect the release of the latch levers **76** from the lugs **72** (as shown in FIG. 11) at the completion of a stack of tile on a tray **18** to permit the return of the wiper yoke **50** to its rearward starting position, so that the platform **16** can then be rotated to bring the succeeding empty tray into position in front of the yokes. When released from the latch means the wiper yoke is automatically returned to its rearward starting position by means of spiral springs **88** on the outer rods **40**, abutting the forward supports **42**, where the yoke will remain until engaged again by the tile yoke on its next forward movement, when the wiper yoke will again be brought to its extreme forward position and automatically latched in that position during the operation of depositing a stack of tile on the succeeding empty tray **18** rotated into position in front of the yokes **44** and **50**. Accordion type bumpers **90** on the rods **40** between the rear end of the yoke **50** and the rear rod supports **42** stop the rearward movement of the yoke without shock. During the stacking operation the tile carrying yoke **46** moves back and forth independently of the wiper yoke **50** in response to movements of the piston rod **70** of the cylinder C.

The wiper member **54** is connected by piston rod **92** to an air cylinder E mounted on the top of wiper yoke **50**. This cylinder effects vertical movements of the wiper as hereinafter described.

A flat bottomed auxiliary trough **94**, of substantially the same width as the tile carrying trough **46**, is fixedly mounted on the rear end of the base **10** in longitudinal alignment with trough **46** and with its bottom surface in a plane approximately coincident with the top of the shallow ledge **64** on the rear end of the trough **46**. The trough **94** is provided interiorly with spring urged pressure plates **96** to bear against the top surfaces of tile T being pushed from the trough **94** toward the tile carrying trough **46**. The inner bottom surface of the auxiliary trough **94** is in approximate coincidence, or slightly below, the top surface of a tile press die **98**, so that the tile produced in the die will after being lifted from the die be pushed into the auxiliary trough **94** by the front end of the conventional clay dust tray **100** on its next forward movement to convey clay dust to the die in the usual tile producing operation. Assuming the press to be in continuous operation, the layers of tile pushed from the press die will, in turn, abut and push the preceding tile T into the carrier trough **46**. As shown in FIG. 7, the front ends of the tile stop slightly short of the front end of the carrying trough **46**, which is in close proximity to the soft resilient wiper blade **56**. By control means to be described, the cylinder C will then move the tile carrying yoke **44** forwardly until the front end of the tile T abut the blade **56**, as shown in FIG. 8. This will align the ends of any individual tile which have become disarranged during their movement into and through the carrying trough. The cylinder C will then move the tile carrying tray rearwardly a short distance at which time the cylinder E lifts the wiper member **54**, and the cylinder C carries the tile to its stacking position over the tray **18**. The wiper member **54** is again lowered and the metal blade **58** will engage the rear ends of the tile

to prevent backward displacement from the stack when the tile carrying tray is withdrawn, as hereinafter described. Since the clay dust tray **100** is operated by a conventional air cylinder (not shown) through a piston rod **102** (FIG. 1) its forward movements are rapid and the contact of its front end with the tile on the press die is abrupt. Therefore, the pressure plate **96** is of advantage in keeping the tile moving in smooth relation.

From the foregoing description it will be seen that my improved tile stacking machine is equipped to carry tile from the tile press as it is produced, stack it in the course of continuous production, and remove the stack to a convenient location for removal from the platform **16** without the necessity of any manual steps in the stacking operations. Moreover, since tile presses are now made to operate automatically, including the conveying of clay dust to the press die, my improved tile stacking machine installed in conjunction with such a press renders the entire operation of producing and stacking tile in any desired number entirely automatic, efficient and economical.

It is further obvious that my invention can be adapted to the unstacking of plates or sheets of any size or thickness, while keeping the top of the stack on the same plane, by reversing the movement of the platform **16**.

As previously explained, the hydro-pneumatic cylinder A and the air cylinders B, C, D and E, as well as the electrical control valves and actuating switches, hereinafter referred to, and which are shown schematically in FIG. 1, are of conventional types procurable on the market and connected in a suitable electrical circuit (not shown). The functioning of the various valves, switches and cylinders in the specific embodiment of my tile stacking machine illustrated will now be described.

The means for operating the hydro-pneumatic cylinder A include a well W (FIG. 1) partially filled with oil O or other suitable liquid, this well being in communication at its bottom, through an increment control valve V3, with the bottom of the cylinder A and at its top, through a 3-way control valve V5, with a source of air pressure. The top of cylinder A also is in communication, through a 3-way control valve V4, with a source of air pressure. It should be understood that as shown in FIG. 1, control valve V4 is open and valve V5 is closed, with its relief outlet open to the atmosphere. Valve V3 is also closed except when actuated as hereinafter described. It should also be understood that the tile carrying yoke **44** and the wiper yoke **50** as shown in FIG. 1 are in their rearward, or initial starting positions; also that the clay dust tray **100** has just completed a cycle of horizontal movements over the tile press die **98**, the last one pushing the newly pressed batch or layer of tile T from the press die into the stationary auxiliary trough **94**. In the succeeding cycle of movements of the clay dust tray the layer of tile mentioned above will be pushed on into the tile carrying trough **46**, as shown in FIG. 7, and carried forward by successive movements, to be described, to the tray **18** and stacked thereon. In the last forward cyclic movement shown in FIG. 1 the dust tray **100** has over-ridden a one-way electrical switch S1 connected in the circuit with an electrical valve V1 which controls the movements of air cylinder C connected through piston rod **70** to the tile carrying yoke **44**. Upon its return movement to its initial starting position the dust tray will actuate switch S1 and control valve V1, causing the piston of cylinder C to move tile carrying yoke **44** to its extreme forward position, as shown in FIG. 9 (assuming that the stacking operation has proceeded to the extent shown in that view). Upon the first forward movement of the tile carrying yoke **44** (after the position shown in FIG. 1) the lugs **74** on its rear end will engage the lugs **72** on the front end of the wiper yoke **50** and both yokes will then move to their extreme forward positions and the wiper yoke will be automatically latched in its forward position (as shown in broken lines in FIG. 9) until unlatched (as shown in FIG. 11) at the completion of a stack of tile on a tray **18**, as will be described.

At the end of its extreme forward movement the end of the tile carrying yoke **44** will contact a switch S2 which will immediately actuate air pressure control valve V2 and move wiper **54** to its down position (as shown in FIGS. 9 and 10). As the tile T deposited on the tray **18** passes under the lever S4*a* of a retarded action switch S4, which is connected in series through switch S3 with the control valve V3 between cylinder A and well W, will be activated to control the opening and closing of that valve, but will not become effective until tile carrying yoke **44**, slightly delayed by the timing action through valve V1, returns to its initial rearward starting position and contacts switches S2*a* and S3, which switches perform different functions, as will be explained. At the moment that tile carrying yoke **44** contacts switch S3, valve V3, regulated by switch S4, will permit the flow of a sufficient quantity of liquid from cylinder A to well W to lower the platform or table **16** a distance equal to the thickness of the layer of tile T deposited on the tray **18**. Since the extent of lowering of the platform is controlled by the lift of the lever S4*a*, the movement will vary according to the thickness of the layer of tile under the lever at the time of its actuation. When the lever S4*a* of the switch S4 loses contact with the top surface of the tile the valve V3 will close.

As more clearly shown in FIG. 7 the layers of tile T are somewhat shorter than the tile carrying trough **46**, so that when a layer of tile is pushed into this trough the front ends of the tile fall slightly short of the front end of the trough, as shown. Switch S3 being also connected in the circuit with valve V2 will hold the wiper **54** in its down position during the withdrawal movement of the yoke **44** with carrying trough **46**, the blade **58** (FIGS. 9 and 10) preventing backward displacement of a layer of tile deposited on the tray **18**. Contact of the tile carrying yoke **44** with switch S2*a*, also connected in the circuit with valve V1, causes the piston **70** to stop and immediately move forwardly with the tile yoke **44** a sufficient distance to bring the front ends of the next layer of tile against the soft resilient blade **56** (FIG. 8) thereby bringing the front ends of any disarranged tile into alignment. Immediately afterward the cylinder C will retract the piston rod **70**, withdrawing the tile carrying trough **46** a slight distance, to free the wiper blade **58** from the end of the tile, and the action of switch S3 will then cause the cylinder E to move the wiper **54** to its uppermost position, after which the valve V1 will cause the piston to move the tile carrying trough and layer of tile to its extreme forward position above the tray **18** upon which tile is being stacked.

The sequence of operations described above will continue until a stack of tile is completed, after which the operation will be as described hereinafter.

After the last layer of tile has been stacked a switch S5 is actuated by the lower end of one of the rods **26** of the platform support **14**. This switch is in series with switch S3 and also with valve V6, which operates rotatable cylinder B, and valve V7, which operates latch cylinders D; and upon the last cyclic rearward movement of the tile carrying yoke **44** when contact with said switch S3 is made by the yoke, the platform **16** will be first automatically lowered slightly to bring the vertical walls **22** and **24** of the tray **18** below the switch lever S4*a* and then rotated by the cylinder B through ratchet wheel **20** until an abutment S6*a* on the platform **16** contacts a switch S6 on the support **14**. This stops the rotation of the platform with the succeeding empty tray **18** in position in front of the yokes **44** and **50** to receive a new stack of tile. At the same time switch S5 will actuate valve V7 of cylinders D to release the latch levers **78** from the lugs **72** on the wiper yoke **50**, thereby permitting that yoke to be automatically returned to its rearward starting position by the springs **80** on rods **40**.

Upon the final downward movement of the platform **16** a portion of it will actuate a switch S7, which is connected with valves V5, V3 and V4. This closes the flow through valve V4, exhausting to the atmosphere, through its relief outlet, the air pressure from the top of cylinder A, also closing the relief outlet of valve V5 and admitting air pressure to the top of well W, and fully opening valve V3 to permit free flow of liquid from well W into cylinder A, so that its piston (not shown) will be forced to its uppermost position. Then, switch S8 which is connected with valves V3, V4 and V5 will again close valve V3, air pressurize the top of cylinder A and release to the atmosphere the air pressure from the top of well W. Thereafter, another tile stacking operation will proceed as hereinbefore described.

It will be apparent from the foregoing description that, as shown in FIGURE 1, and apart from its cooperative connection with switch S3 in coordinating the movements of the tile carrying yoke **46** with those of platform **16**, a distinctive and important function of switch S4 is to effect, through its connection with valve V3, a vertical downward movement of platform **16** a distance equal to the thickness of a tile T pushed under the switch actuating element S4*a*. It will also be seen that a distinctive and essential function of switches S7 and S8, through their connection with valves V3, V4 and V5, apart from their cooperation in the rotation of the platform, after a stack of tile has been completed, is to raise the piston of cylinder A to its starting position to place it in condition for another cycle of stacking operation. The same valve and other operating elements referred to may thus be advantageously employed in the stacking of sheets or other flat objects of any character or thickness on the platform **16**, either mechanically or manually, under any conditions where it is necessary or desirable to keep the top sheet in substantially the same plane for the convenience of the stacking operation, irrespective of whether the platform is rotatable or non-rotatable or the manner in which the sheets are deposited on the platform.

It will, moreover, be apparent from the foregoing description that by a simple reversal of the operation of the valves and other elements referred to a stack of sheets, such, for example, as hides or the like, can be unloaded from a stack on a non-rotatable platform while the top of the stack of sheets on the platform is maintained at substantially the same level. In such a reverse operation the platform **16** will be in its lowest plane at the start of the unloading or unstacking operation, and by means of switch S7 the top end of well W will be pressurized through valve V5, and the relief port of valve V4 opened, as previously described. Then, each time a sheet, corresponding to a tile T or the like, is withdrawn from the stack the switch actuating element S4*a* will drop (instead of rise) thereby causing valve V3 to admit a sufficient quantity of liquid from well W into cylinder A to force platform **16** upwardly a distance equal to the thickness of the sheet. When the last sheet is withdrawn from the stack the switch element S4*a* will cause the platform to rise slightly and render this switch inactive, while at the same time switch S8 will be activated, thereby releasing the air pressure from the top end of well W through valve V5 and pressurizing the top end of cylinder A through valve V4, thus causing the platform **16** to be lowered against the static head of the liquid in well W until it reaches its lowermost or starting position, when switch S7 will again be activated to pressurize the top end of well W through valve V5 and release the air pressure from the top end of cylinder A through valve V4, thereby placing cylinder A in condition for another cycle of unloading or unstacking operation, as already described.

Since the operation of stacking or unstacking of sheets on or from the vertically movable platform **16**, irrespective of whether it is rotatable or non-rotatable, or whether the vertical step by step movements are in one direction or the other, involves no additional features of construction in the embodiment of my invention shown in the drawing—required to adapt it to the specific uses described above, it is to believed that no additional illustration is necessary.

It should be understood that if the platform **16** is of sufficient weight to overcome the static head of the liquid in well W by gravity it would be possible to dispense with the air pressurizing of the top end of cylinder A, in which case only the air relief port in the place of valve V4 would be necessary to prevent the piston of the cylinder from becoming air bound in its upward movement. Obviously, that would not involve the addition of structural features to any of the operating elements shown and described.

Obviously, various modifications or changes in the construction and operation of my improved machine may be made within the spirit and scope of my invention. Therefore, it should be understood that my invention is restricted only by the appended claims.

I claim:

1. In a tile stacking machine of the character described, and in combination, a base, a vertically movable platform support at the front end of said base, a platform rotatably mounted on said support, said platform carrying on its outer surface a plurality of equidistantly spaced, rectilinear trays having flat bottoms, a pair of arch-like yokes having substantially horizontal tops mounted on and across said base rearwardly of said platform in telescopically movable relation toward and from said platform, the narrower of said yokes being initially inclosed within the other, the narrower yoke also having a flat bottomed tile carrying trough at its top longitudinally centered on the center of said platform, the bottom of said trough being in a plane slightly above that of the bottoms of the trays on said platform and the wider of said yokes having at its top a depending, elongated and vertically movable wiper adapted to traverse the tile carrying trough inside its walls, means on said base connected to said wiper for moving it vertically in either direction, means on said base connected to said tile carrying yoke for moving it forwardly to a position in which it will inclose the open end portion of one of said trays and subsequently returning said yoke to its rearward starting position, longitudinally spaced coengaging means on said yokes for effecting a more limited forward movement of said wiper yoke than that of said tile carrying yoke, latch means on said base engageable with said wiper yoke for holding it in its extreme forward position and also for releasing it from said yoke; means on said base cooperative with said wiper yoke for automatically returning it to its rearward starting position when released from said latch means, means on said base connected with said platform support cooperative with tile stacked thereon to effect the lowering of said support and platform during the stacking operation; and means on said platform support connected with said platform for effecting sufficient rotation of said platform to bring an empty tray in front of said yokes after completion of a stack of tile on the preceding tray, said wiper when lowered to wiping position at its extreme forward position having means to engage the rear ends of tile deposited on a tray to prevent backward displacement of the tile upon withdrawal of the tile carrying yoke and trough from the tray.

2. A tile stacking machine according to claim 1 and including a pair of parallel, horizontally extending and transversely spaced guides on said base on which the arch-like tile carrying yoke is mounted at its lower ends for longitudinal movement thereon, and also including a second pair of similar guides on said base transversely spaced outwardly from said other guides, the wiper yoke being mounted at its lower ends on said second guides for longitudinal movement thereon.

3. A tile stacking machine according to claim 1 in which the latch means for holding the wiper yoke in its

extreme forward position include a lug on the lower inner wall of said yoke, and a horizontal lever having at its rear end a shoulder for engagement with said lug, said lever being pivoted intermediately to the machine base and having a leg portion depending vertically from its point of pivot, said latch means also including a separate vertical lever pivoted intermediately thereof to the base with its upper end in contact with the depending leg portion of the horizontal lever, the latter having a spring attached to its front end and the base urging that end downwardly, the free end of the vertical lever being connected to the means for releasing said latch means from said yoke.

4. A tile stacking machine according to claim 1 in which the wiper includes a blade holder, a metal blade attached to its front edge to engage the rear end of tile in the tile carrying trough and a soft resilient blade attached to its rear edge in spaced relation to the other blade the soft resilient blade being for engagement with the front ends of tile for alignment thereof before entering the tile carrying trough.

5. A tile stacking machine according to claim 1 in which the tile carrying trough is provided with a shallow ledge extending across its rear end to engage the rear ends of tile in said trough.

6. A tile stacking machine according to claim 1 and including an auxiliary flat bottomed trough on said base rearwardly of and initially closely adjacent to the rear end of the aforesaid tile carrying trough to receive the tile pushed therein.

7. A tile stacking machine according to claim 1 in which the tile carrying trough on the tile carrying yoke projects beyond the edges of said yoke longitudinally of the trough.

8. A tile stacking machine according to claim 1 in which each of the trays carried by the platform is provided with a single side wall.

9. A tile stacking machine according to claim 1 in which the means for effecting vertical movement of the wiper, the means for effecting horizontal movement of the tile carrying yoke, the means for effecting release of the latch means, and the means for effecting rotation of the platform consist of air cylinders having valve means in communication with said cylinders and a source of air pressure for controlling the operation of said cylinders; and in which the means for effecting the lowering and raising of the platform support and platform consists of a hydro-pneumatic cylinder having valve means in communication with the top of said cylinder and a source of air pressure, a well containing liquid, valve means in communication with the bottom of said well and the bottom of said cylinder, and valve means in communication with the top of said well and a source of air pressure for controlling the flow of liquid from said well into and from said cylinder.

10. A tile stacking machine according to claim 2 in which the parallel guides consist of rods rigidly mounted in supports at the ends of the base, and in which the means cooperative with the wiper yoke for returning it to its rearward starting position consists of spiral springs mounted on the outer rods between said wiper yoke and their adjacent rod supports.

11. A tile stacking machine according to claim 6 in which the auxiliary flat bottomed trough is provided between its walls with a spring urged pressure plate for pressure contact with the top surfaces of tile passing through said trough into the trough of the tile carrying yoke.

12. A tile stacking machine according to claim 8 in which the wiper yoke has at one side an upwardly projecting loop portion and the tile carrying yoke also has at the same side a similar upwardly projecting loop portion so dimensioned as to permit its passage through the loop of the wiper yoke and also to freely receive the single side wall of either of the trays on the rotatable platform when said wall is in edgewise alignment with said loop.

13. A tile stacking machine according to claim 9 in which the air cylinder connection for effecting forward and return movement of the tile carrying yoke includes a transverse bar thereon having a central upstanding projection connected to the air cylinder piston rod, said bar being attached at its ends to the lower end portion of the yoke.

14. A tile stacking machine according to claim 9 in which the hydro-pneumatic cylinder means for effecting the lowering of the platform includes a liquid conduit communicating with the bottom ends of the cylinder and well, an electrical flow control valve, a retarded action electrical switch actuated by contact with tile on said platform and in an electrical circuit with said flow control valve for controlling the withdrawal of liquid from said cylinder into said well in varying amounts depending only upon the thickness of the layer of tile actuating said switch, a combined air inlet and relief valve communicating the upper end of said well with a source of air pressure, and a combined air inlet and relief valve communicating the upper end of said cylinder with a source of lower air pressure.

15. A tile stacking machine according to claim 9 in which the air cylinder means for effecting rotation of the platform includes a ratchet wheel connected to the center of the platform and a pawl carried by the air cylinder piston rod for engagement with the ratchet wheel.

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