

[54] **STACKER WITH A LABELING MACHINE**

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[51] Int. Cl. B32b 31/20, B65h 31/12
[58] Field of Search 156/566, 567, 568, 521, 528; 271/88

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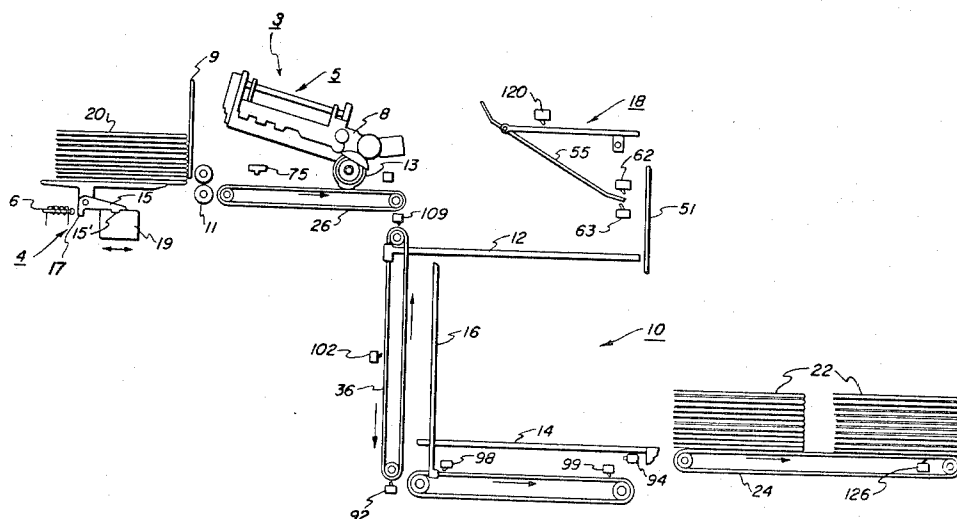
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[57] **ABSTRACT**

An article stacker labeler combination including a movable elevator upon which articles may be stacked from a labeler, stack transfer means adapted following predetermined descent of the elevator to intercept and remove a completed stack from the elevator to enable the completed stack to be ejected from the stacker and the elevator reset for the next stack, stack ejector means adapted when actuated to move the completed stack along the stack transfer means and out of the stacker, and control means for the elevator and the ejector means adapted to lower the elevator as a stack builds up thereon, and, following transfer of the completed stack from the elevator to the transfer means, to actuate the ejector means to remove the completed stack, the control means including means to quickly return the elevator to the stack-start position following ejection of the completed stack from the stacker.

2 Claims, 6 Drawing Figures



Patented April 4, 1972

3,654,040

6 Sheets-Sheet 1

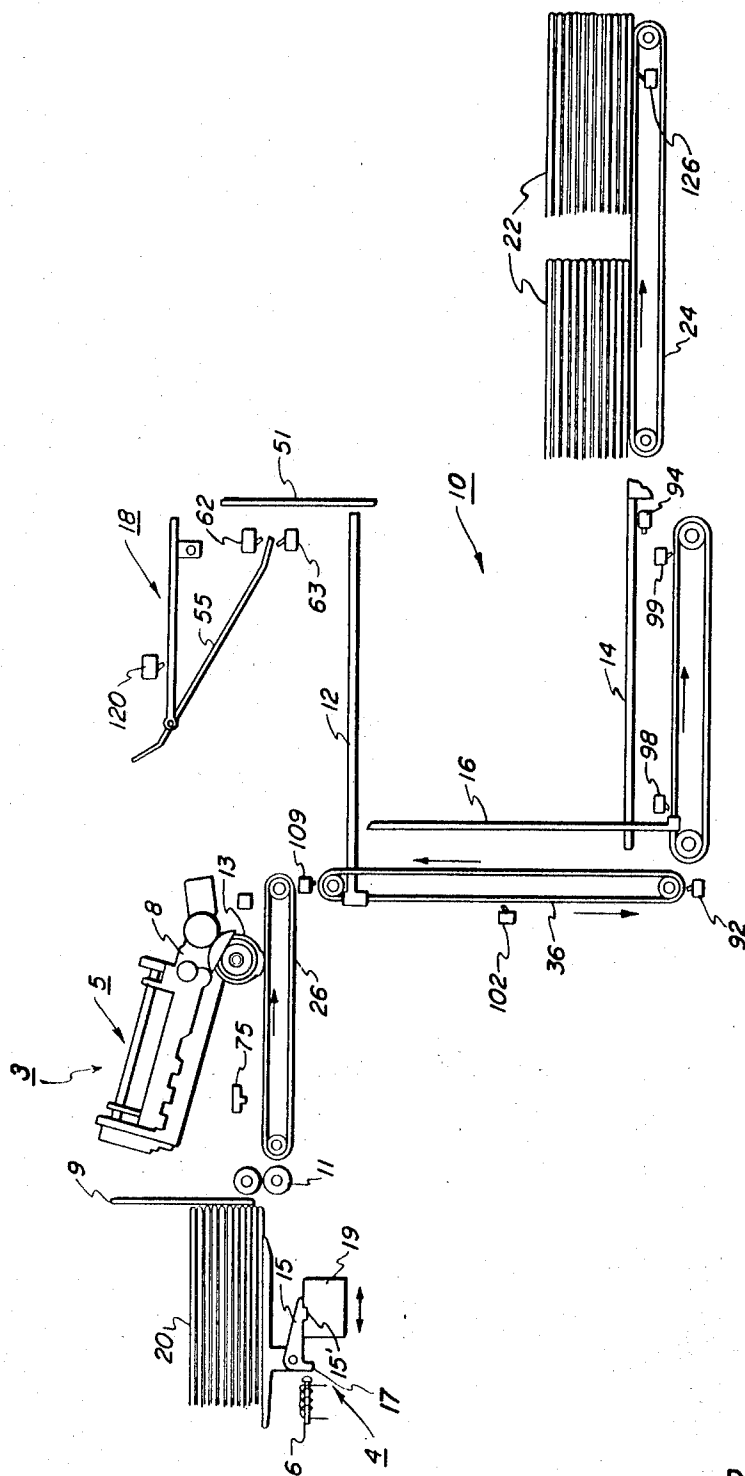


FIG. 1

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3,654,040

6 Sheets-Sheet 2

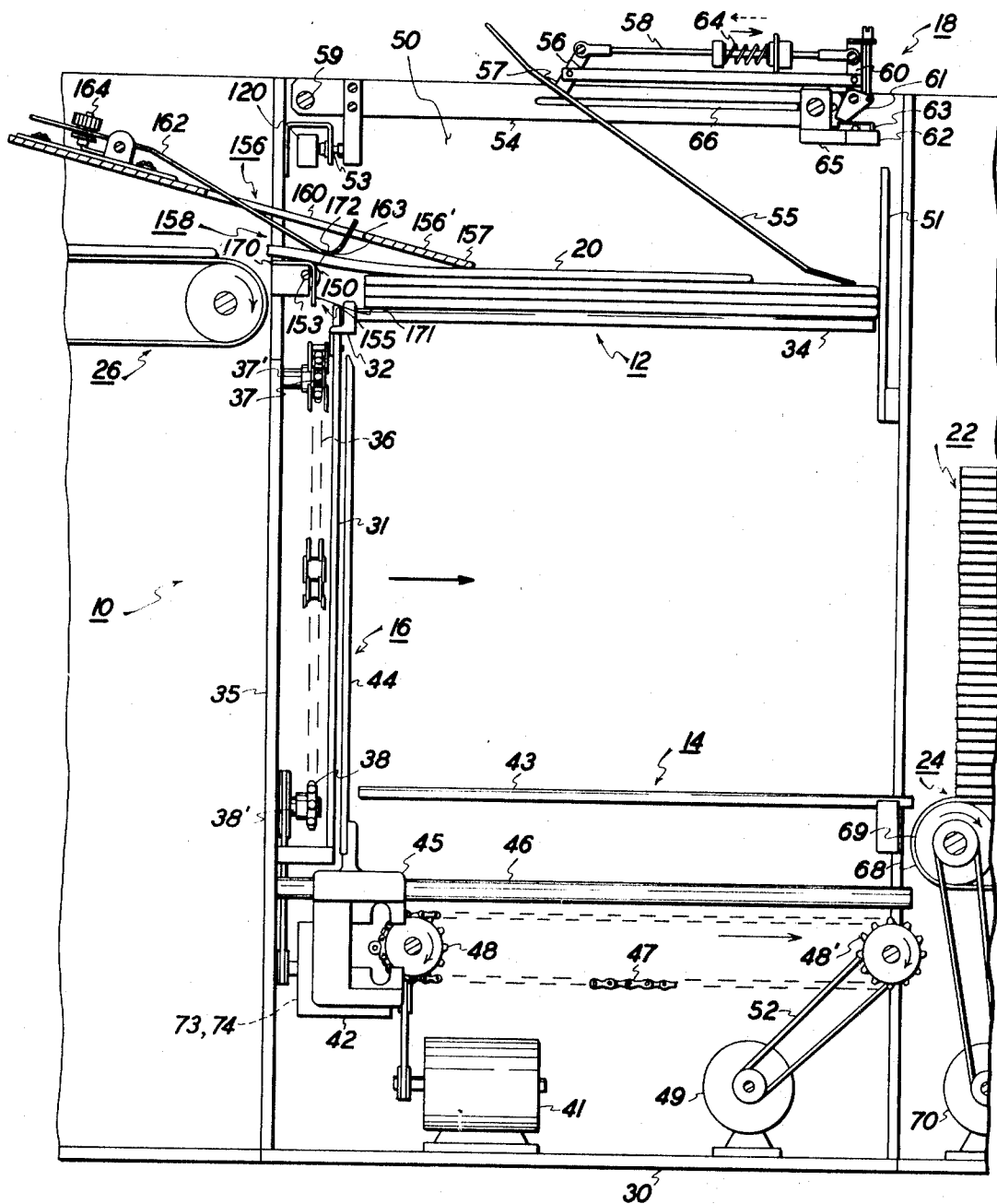


FIG. 2

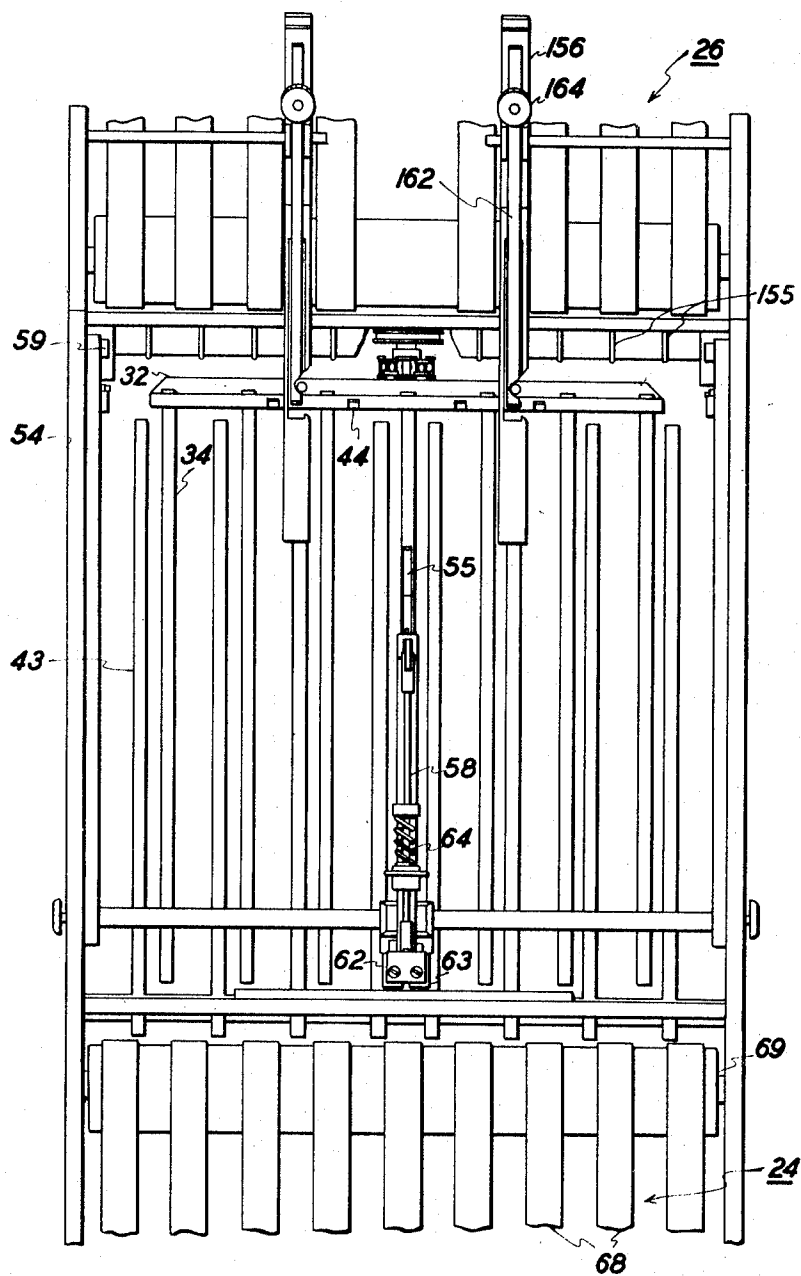


FIG. 3

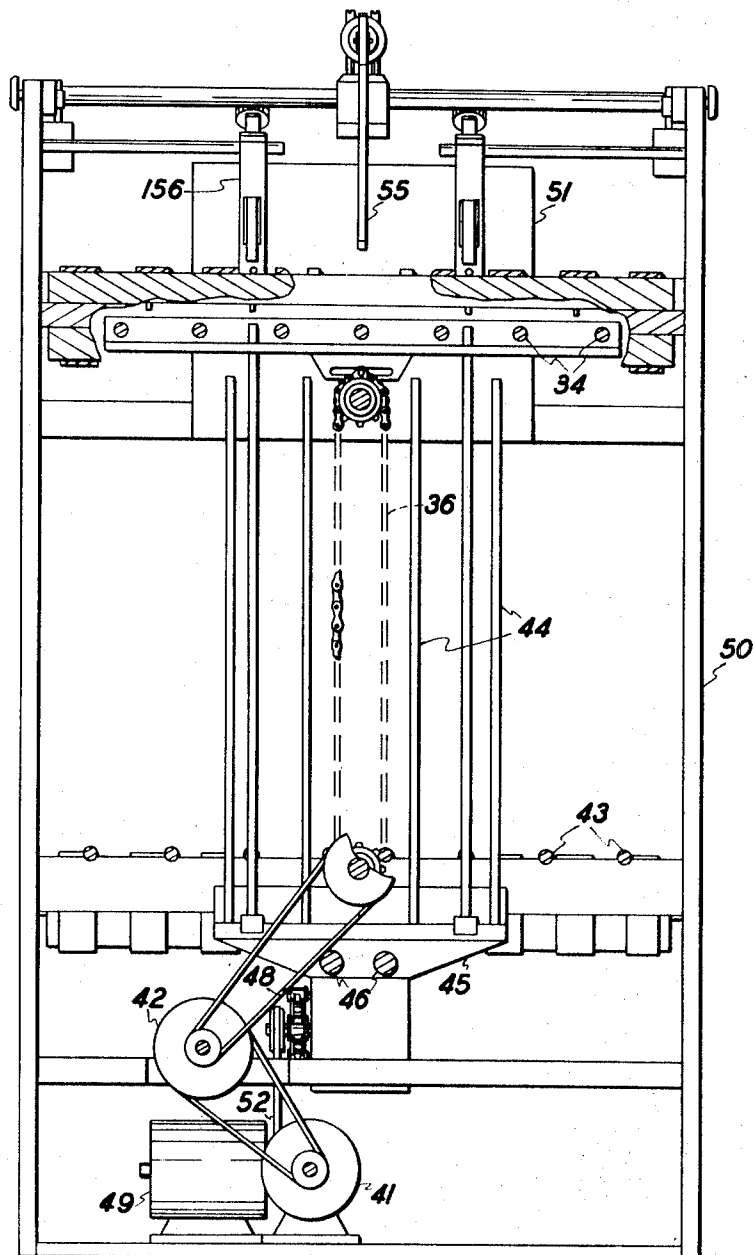


FIG. 4

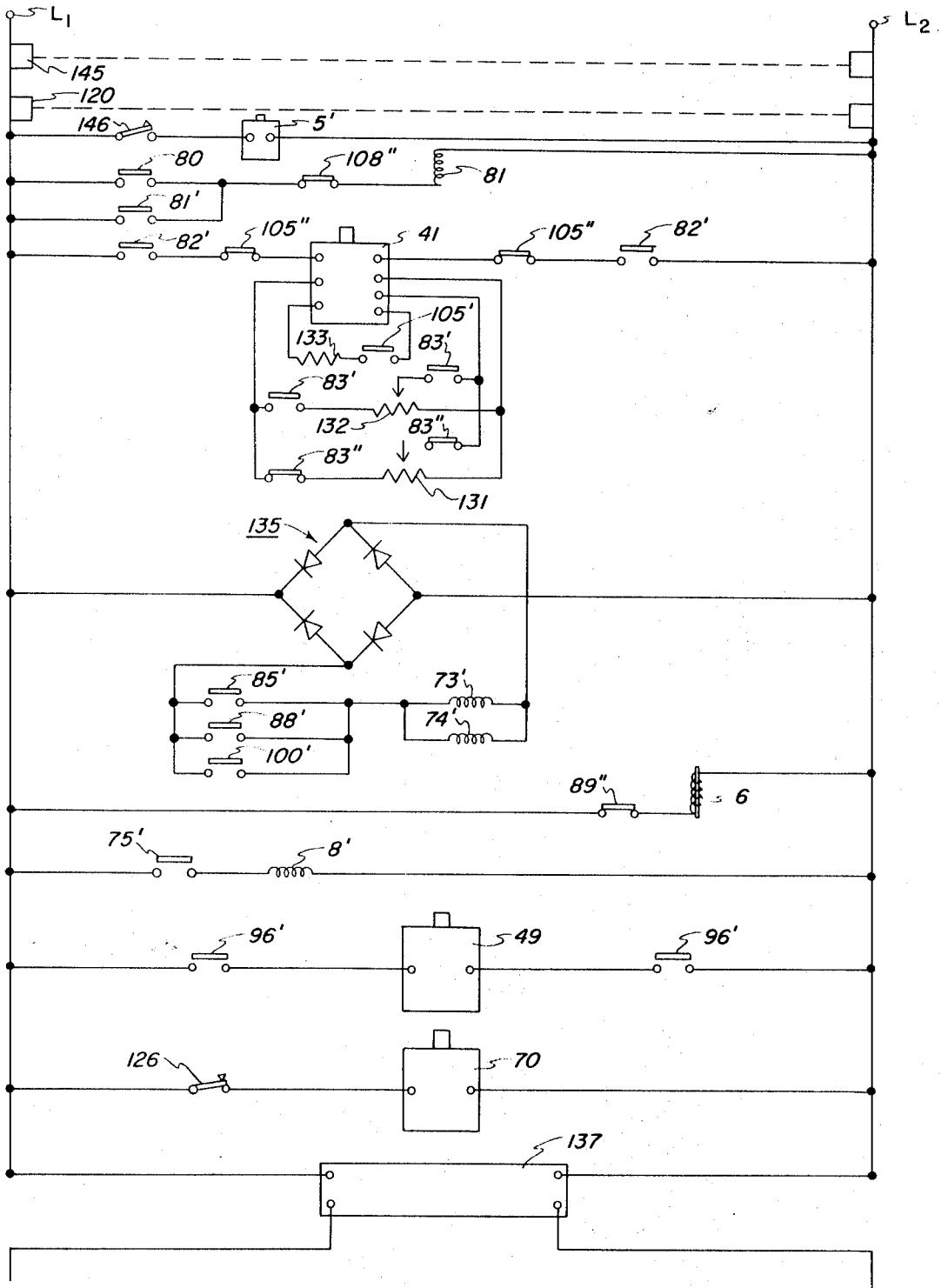


FIG. 5a

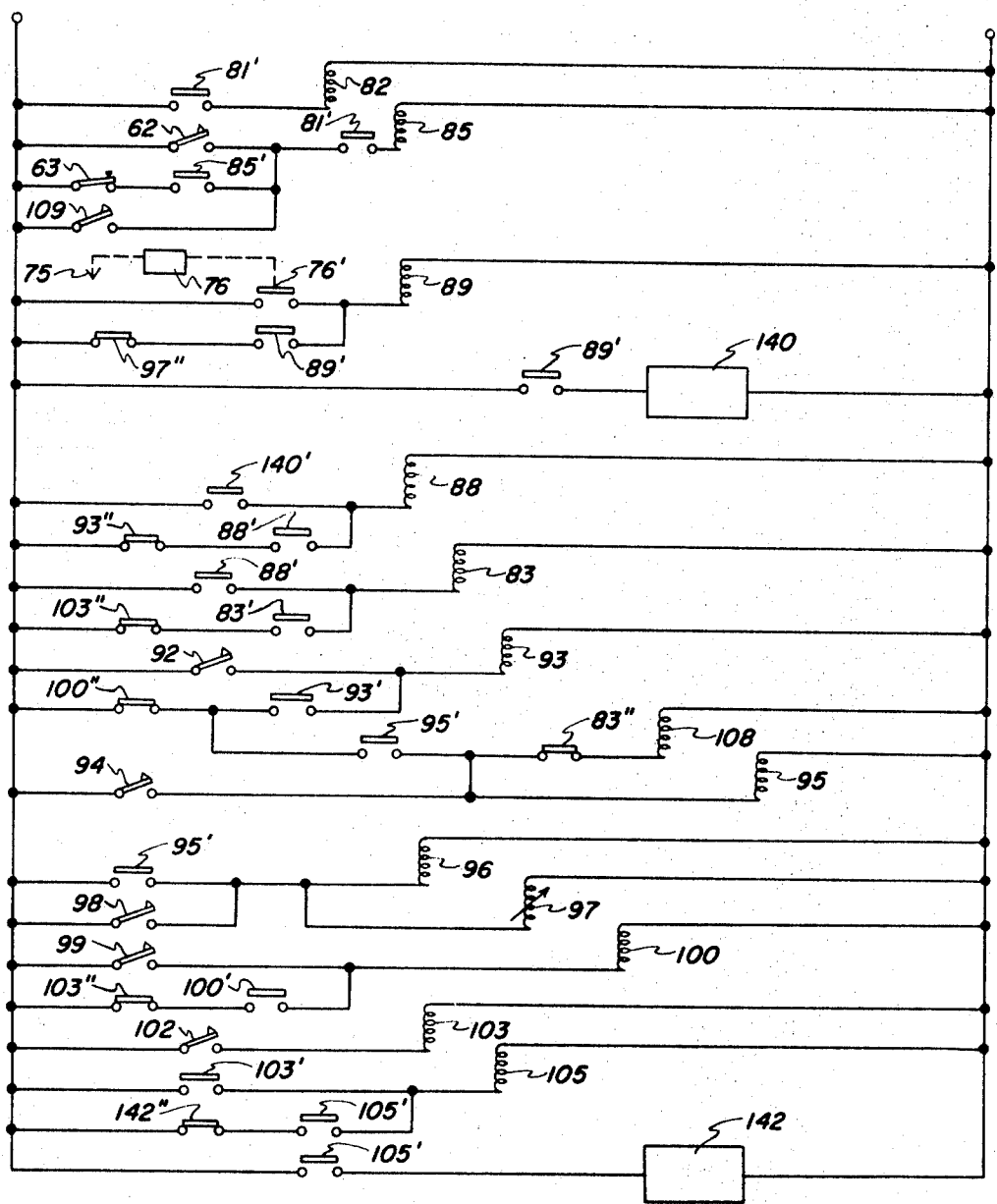


FIG. 5b

STACKER WITH A LABELING MACHINE

This invention relates to an article stacker, and more particularly, to an improved article stacker incorporating a multiple speed stacking elevator with cooperating stack transfer and ejecting means.

In handling articles such as newspapers, magazines, envelopes, and the like, it is frequently desirable to form the articles into stacks. This may occur for example in article labeling or addressing systems, where addressed articles having common Zip Code designations must be bundled together for group mailing in accordance with Post Office regulations. While the articles may of course be manually stacked, or stacked through manual stopping and starting of a stacker in accordance with the number of articles in each Zip Code group, such manual stacking or manual stacker is expensive in terms of labor costs and inefficiency in high volume article addressing systems.

In designing article stackers, a principle objective seems to be to build a stacker where no loss of or interruption in article input is sustained during the period while the finished stack is being ejected from the stacker and the stacking elevator reset for the next stack. The prior art affords numerous teachings of stacker designs and constructions aimed at fulfilling this objective; for example, there are numerous stacker designs where, during the stack ejecting and elevator reset cycles, a temporary stack support or elevator is interposed in the article flow path. Following ejecting of the completed stack and clearing of the main elevator, the main elevator is reset to the stack-start position. The temporary elevator is then removed and the partially completed stack formed thereon transferred to the main stacking elevator. While stackers of this type do not require that the article input be interrupted during the reset cycle, they unfortunately suffer from excessive cost and extreme complexity.

It is a principal object of the present invention to provide a new and improved article stacking apparatus.

It is a further object of the present invention to provide an improved article stacking apparatus incorporating means to interrupt the article supply while the finished stack is removed.

It is an object of the present invention to provide a relatively simple, low cost article stacker having a high article throughput speed.

It is an object of the present invention to provide an article stacking system having means to delay clearing and resetting of the stacker pending arrival of the last article thereto.

This invention relates to an article processing system comprising, in combination, article addressing means including a labeling head for transferring address information to articles; means for supplying articles to be addressed to the addressing means; an article stacker for arranging addressed articles from the addressing means into stacks including a stacking elevator operatively disposed adjacent the discharge side of the addressing means; means to support addressed articles discharged by the addressing means; means to lower the elevator as the stack of articles thereon builds up; stacker reset means adapted when actuated to clear the article stack from the elevator and raise the cleared elevator into position for the next article stack; and control means for stopping the articles supplying means to interrupt the flow of articles to the stacker while the stacker is being reset.

Other objects and advantages will be apparent from the ensuing description and drawings in which:

FIG. 1 is a schematic representation of an article addressing system incorporating the article stacker of the present invention with the elevator drive chain displaced through 90° from a true position to facilitate explanation;

FIG. 2 is a side view partially in section of the article stacker shown in FIG. 1;

FIG. 3 is a top plan view of the article stacker shown in FIG. 1;

FIG. 4 is an end view with parts broken away of the article stacker shown in FIG. 1; and

FIGS. 5a, 5b are a circuit diagram of the control means for the article stacker shown in FIG. 1.

Referring particularly to FIG. 1 of the drawings, an article stacker 10 is thereshown incorporated into an article addressing or labeling system 3. Labeling system 3 includes an article feeder 4 of the type shown in copending application, Ser. No. 774,956, filed Nov. 12, 1968 in the name of D. W. Watson et al., for supplying articles 20, such as magazines, newspapers, envelopes, and the like in seriatim to an addressing machine 5. Articles discharged by feeder 4 pass through a suitable article control means, such as gate 9 and pinch roller pair 11 onto article transport 26 of addressing machine 5. To control the feed of articles 20 to addressing machine 5, article feeder 4 incorporates a solenoid operated disconnect 6 adapted when actuated to move forward into the path of movement of depending drive latch arm 17 causing latch 15 to pivot upwardly and withdraw drive lug 15' thereof from driving slider 19. Slider 19 is conveniently driven through suitable eccentric means (not shown) from addressing machine drive motor 5'.

Addressing machine 5 comprises any suitable article labeling or addressing machine such as that described in copending application, Ser. No. 653,144, filed July 13, 1967 in the name of R. C. Sheriff. Addressing machine 5 includes a labeling head portion 8 with rotatable label transfer wheel 13 for transferring individual labels or the label information thereon to the articles 20 moving therebelow on article transport 26. Labeling head 8 including transfer wheel 13 is driven by suitable drive means through a suitable electromagnetically controlled clutch (not shown). As will appear, the operating coil 8' for the labeling head drive clutch is controlled by article sensor 75 arranged above transport 26 to sense the feed of articles to transfer wheel 13. On interruption in the feed of articles to transfer wheel 13, sensor 75 stops head 8 to prevent loss or mutilation of the address labels.

The addressed articles are carried by transport 26 to stacker 10 where, as will appear, the articles are automatically stacked into stacks of predetermined size or quantity. Completed stacks 22 from stacker 10 are ejected therefrom by ejector 16 onto stack discharge conveyor 24 for removal from the system 3. As will appear, a suitable article counter 76, (shown in FIG. 5) is provided to count the articles processed. Conveniently, article sensor 75 is utilized to provide the input signal to counter 76.

Referring particularly to FIG. 2 of the drawings, article stacker 10 includes stacking elevator 12, stack interceptor 14, stack ejector 16, and stack height control 18. As will appear more fully herein, stacker 10 is adapted to form articles 20, which may comprise envelopes, newspapers and the like, into stacks 22 of predetermined height and/or quantity. The completed stacks 22 are removed by means of stack discharge conveyor 24.

Article stacker 10 includes a base 30 having upstanding bearing bars 31 upon which carriage 32 of elevator 12 is journaled for vertical movement. Elevator carriage 32 carries a plurality of horizontally extending, spaced apart bars 34 thereon which cooperate to form the base or floor upon which articles 20 being stacked rest.

Elevator carriage 32 is secured to vertical driving chain 36 carried by upper and lower sprockets 37, 38. Sprocket shafts 37', 38' are journaled on rear frame member 35. Sprocket shaft 38' is suitably driven by two speed motor 41 through transmission 42. Transmission 42 includes a suitable electromagnetically operated clutch 73 effective when engaged to couple chain 36 with motor 41 and an electromagnetically controlled brake 74 effective when engaged to hold elevator 12 against movement. As will appear, clutch 73 is normally disengaged while brake 74 is normally engaged so that energization of clutch and brake operating coils 73', 74' engages clutch 73 and releases brake 74.

As will appear, elevator 12 is lowered at low speed during stacking and is reset to the stack-start position of FIG. 1 at high speed. Elevator control switches 92, 94, 102, 109 are arranged along the path of movement of elevator 12.

Stacker 10 has upstanding sides 50 supported on base 30 to prevent the articles 20 from falling off elevator 12 during stacking. A suitable stop 51 is provided to limit forward movement of articles 20.

Stack height control 18 includes a control ski 55 pivotally suspended above elevator 12 on arm 56. Arm 56 is in turn secured to switch base 65 suitably supported in side members 54. Side members 54 are carried on rotatable cross-shaft 59 journaled in the upstanding stacker sides 50. An abutment 53 limits downward swinging movement of the height control 18 about cross-shaft 59. Preferably, side members 54 have a longitudinally extending slot-like opening 66 therein to enable the position of height control 18 to be adjusted in correspondence with the length of the articles 20 being handled.

A switch control arm 60 is pivotally attached to the opposite end of arm 56 above elevator start and stop switches 62, 63 on base 65. A suitable switch operating cam 61 is mounted on the lower end of control arm 60 in operative relation with switches 62, 63.

A control link 58 is pinned between the upstanding support base 57 of ski 55 and switch control arm 60 such that swinging movement of ski 55 results in corresponding swinging movement of control arm 60. A suitable biasing spring 64 is provided to bias control link 58 in the direction shown by the solid line arrow and ski 55 in a counter-clockwise direction. Suitable stop means (not shown) are provided to limit swinging movement of ski 55.

As can be understood, the weight of height control 18 normally serves to maintain the control 18 in the position shown against abutment 53. Where a malfunction in labeling system 3 results in an unwarranted increase in the height of articles 20 on elevator 12, height control 18 is forced upwardly in a counter-clockwise direction about cross-shaft 59. To protect the labeling system 3 against malfunctions of this type, stop switch 120 is provided. Switch 120 is arranged so that preset raising movement of stack height control 18 actuates switch 120 and shuts down labeling system 3 as will appear.

As can be appreciated, articles 20 discharged onto elevator 12 by article transport 26 slide or skid across the surface of bars 34, or the topmost article resting thereon, under ski 55 and into abutment with article stop 51. As the height of the article stack on elevator 20 rises, ski 55 is turned in a counter-clockwise direction is displace control link 58 in the direction shown by the dotted-line arrow in FIG. 2. On predetermined movement of control link 58, switch control cam 61 closes elevator start switch 62 to engage clutch 73 and release brake 74 to move elevator 12 downwardly at low speed. As elevator 12 descends and the effective height of the article stack thereon decreases, ski 55 pivots in a clockwise direction with concurrent movement of control link 58 in the direction shown by the solid line arrow. Following predetermined displacement of control link 58, cam 61 opens switch 63 to disengage clutch 73 while engaging brake 74.

To remove the completed stack of articles on elevator 12, stack interceptor 14 and ejector 16 are provided. Interceptor 14 comprises a plurality of stationary, spaced horizontal support bars 43 arranged in the path of movement of elevator 12 at a level substantially the same as or slightly above the operating surface of stack discharge conveyor 24. The relative spacing between elevator bars 34 and interceptor bars 43 is such that bars 34 are able to pass between bars 43 to enable elevator 12 to descend below interceptor 14 and transfer the stack of articles on elevator 12 onto interceptor 14. Stack interceptor bars 43 are suitably supported by stacker base 30.

It is understood that suitable adjusting means (not shown) may be provided to permit the height of stack interceptor 34 to be varied to match the height of discharge conveyor 24.

Stack ejector 16 comprises a plurality of spaced, upstanding bars 44 supported on carriage 45. Ejector carriage 45 is carried by a pair of spaced, horizontal journals 46 for movement toward and away from discharge conveyor 24. Ejector bars 44 are offset relative to elevator bars 34 and interceptor bars 43 to permit relative movement of elevator 12 and ejector 16 between each other and interceptor 14.

Ejector carriage 45 is attached to drive chain 47. Chain 47 is carried by sprockets 48 suitably journaled on frame 30. Ejector drive motor 49 is connected to sprocket 48' by belt 52. Ejector control switches 98, 99 are arranged along the path of movement of carriage 45 for actuation thereby, switch 98 being operated by ejector carriage 45 when ejector 16 is in the ready or start position shown in the drawings.

Stack discharge conveyor 24 comprises one or more endless belts 68 stretched across suitable support rollers 69. Conveyor 24, which is driven by motor 70, is disposed at substantially the same operative level or slightly below that of stack interceptor 14. As will appear, conveyor 24 is normally operated continuously, control switch 126 serving to stop conveyor 24 on failure of the operator to remove a completed stack therefrom.

Referring to the circuit diagram of FIG. 5, a suitable source of electrical energy, represented by leads L_1 , L_2 , is provided. Suitable start-stop switch means 145 may be provided. System stop switch 120 is provided across leads L_1 , L_2 , stop switch 120 serving when actuated to interrupt power to the addressing system components in the event of an article jam as will appear.

Drive motor 5' of addressing machine 5 is connected through suitable control switch means 146 across leads L_1 , L_2 .

Stacker control relay 81 is connected through start switch 80 and normally closed overstack safety relay contact 180' across leads L_1 , L_2 . Holding contact 81' of relay 81 parallels start switch 80. Elevator drive motor 41 is connected through elevator motor relay contacts 82' and normally closed motor brake relay contacts 105' across leads L_1 , L_2 . Elevator drive motor 41 includes internal low and high speed control windings (not shown) controlled through low and high speed rheostats 131, 132 respectively. Rheostats 131, 132 are electrically connected to the control windings of motor 41 through contacts 83'', 83' of speed control relay 83, relay contacts 83'' being normally closed so that motor 41 operates at low speed as long as control relay 83 is deenergized.

Motor 41 includes an internal braking mechanism, the dissipating resistor 133 of which is connected through brake relay contact 105' across the motor winding in a manner known to those skilled in the art. As will appear, the internal motor brake is used to slow elevator 12 following high speed return of elevator 12 to the stack-start position.

The input terminals of a suitable rectifier 135 are connected across leads L_1 , L_2 . Elevator clutch and brake operating coils 73', 74' are connected in parallel relationship through elevator stack relay contact 85' across the output terminals of rectifier 135. Reset motor relay contact 88' and return relay contact 100' parallel stack relay contact 85'.

Disconnect solenoid 6 is connected through the normally closed feeder control relay contact 89'' across leads L_1 , L_2 . The clutch coil 8' of labeling head 8 is connected through article sensor contact 75' across leads L_1 , L_2 . As will appear more fully, opening of contacts 89'', 75' stops article feeder 4 and labeling head 8.

Ejector drive motor 49 is connected through ejector motor relay contacts 96' across leads L_1 , L_2 . Discharge conveyor motor 70 is connected through normally closed safety switch 126 across leads L_1 , L_2 .

A suitable direct current power supply 137 is provided, the input terminals of which are connected across leads L_1 , L_2 . Elevator motor relay 82 is connected through control relay contact 81' across the output terminals of power supply 137.

Elevator stack relay 85 is connected through elevator start switch 62 and control relay contact 81' across power supply 137. Normally closed elevator stop switch 63 and stack relay holding contact 85' parallel start switch 62. Control transfer switch 109 parallels start switch 62.

Article feeder control relay 89 is connected through counter contact 76' across power supply 137. Article counter 76 comprises any suitable adjustable counting device adapted, following a predetermined count, to temporarily close contact 76' thereof. In the arrangement shown, sensor 75 is used to

provide the pulse-like input signal to counter 76 in response to movement of articles 20 therepast on conveyor 26. It is understood that counter 76 may be pre-set for various article counts automatically. Relay holding contact 89' and normally closed feeder re-start relay contact 97'' parallel counter contact 76'.

A suitable timer 140 is provided to delay initiation of the elevator reset and stack ejecting cycles following stopping of article feeder 4 to give articles already in process on article transport 26 time to reach stacker 10. Timer 140 is controlled by contact 89' of relay 89.

Elevator reset relay 88 is connected through timer contact 140' across the output of power supply 137. Holding contact 88'' and normally closed stop relay contact 93'' parallel contact 140'.

Elevator motor speed control relay 83 is connected through elevator reset contact 88' across power supply 137. Holding contact 83' and normally closed elevator slowdown relay contact 103'' parallel contact 88'.

Elevator stop relay 93 is connected through lower elevator stop switch 92 across power supply 137. Holding contact 93' and normally closed elevator reset-start relay contact 100'' parallel switch 92. Ejector motor control relay 95 is connected through ejector start switch 94 across power supply 137. Holding contact 95' is in series with the normally closed reset-start relay contact 100''. Overstack safety relay 108 is connected through normally closed speed control relay contact 83'' in parallel relationship with relay 95.

Ejector motor control relay 96 and feeder re-start relay 97 are connected in parallel with one another through ejector reset switch 98. Re-start relay 97 comprises any suitable timing relay adapted, on a preset interval following actuation, to open contact 97'' thereof to deenergize feeder control relay 89 and restart article feeder 4 as will appear. Contact 95' of ejector motor control relay 95 parallels switch 98.

Elevator reset-start relay 100 is connected through elevator reset switch 99 across power supply 137. Holding contact 100' and normally closed elevator slowdown relay contact 103'' parallel switch 99. Slowdown relay 103 is connected through upper elevator control switch 102 across supply 137.

Elevator motor brake relay 105 is connected through elevator slowdown relay contact 103' across power supply 137. Holding contact 105' and normally closed timer contact 142'' parallel contact 103'. Timer contact 142'' is controlled by a suitable timer mechanism 142 connected through brake relay contact 105' to the power supply output side.

OPERATION

With the operating components of labeling system 3 in the position shown in the drawings, actuation of start-stop switch means 145 and control switch means 146 completes energizing circuits to feeder solenoid 6 and addressing machine drive motor 5'. Actuation of solenoid 6 couples feeder 4 with slider 19 to initiate feed of articles 20 to addressing machine 5. As the first article approaches labeling head 8, sensor 75 responds to close contact 75' thereof to complete an energizing circuit to clutch coil 8' to start labeling head 8.

With actuation of start-stop switch means 145, an energizing circuit is completed through safety switch 126 to motor 70 to start discharge conveyor 24.

Start-up of the article labeling system 3 closes switch 80 to complete a circuit to stacker control relay 81. Contacts 81' or relay 81 close to complete a holding circuit to relay 81 and a circuit to elevator motor relay 82. Relay contacts 82' close to energize, through contacts 105'', elevator drive motor 41. Inasmuch as motor speed control relay 83 is de-energized, motor 41 operates at low speed through the normally closed contacts 83'' or relay 83. At this point, elevator drive clutch 73 remains disengaged. Elevator brake 74 holds elevator 12 stationary.

As may be understood, article feeder 4 feeds articles 20 to be addressed forward one at a time through gate 9 and pinch

roller pair 11 onto article transport 26 of addressing machine 5. Transport 26 brings the unaddressed articles to label transfer wheel 13 where individual addresses are transferred to each article. The addressed articles leaving transfer wheel 13 on transport 26 are discharged one by one onto elevator 12 of stacker 10, the articles sliding underneath ski 55 and coming to rest with their leading edges against article stop 51.

As the stack of articles 20 on elevator 12 builds up, contact of each succeeding article with ski 55 causes ski 55 to swing in a counter-clockwise direction against the bias of spring 64. Following predetermined swinging movement of ski 55, representing a predetermined stack height, switch control cam 61 thereof closes elevator start switch 62 to complete through control relay contact 81' a circuit to stack control relay 85. Holding contact 85' of stack relay 85 closes to maintain relay 85 energized on subsequent opening of start switch 62 as elevator 12 descends and ski 55 swings backward in a clockwise direction. At the same time, a second contact 85' of relay 85 closes to energize clutch and brake operating coils 73', 74' respectively and engage elevator clutch 73 and release elevator brake 74.

On engagement, clutch 73 couples elevator drive motor 41 with chain drive sprocket 38 to move elevator 12 downwardly at low speed.

As elevator 12 descends, the level of stack of articles thereon falls, the rate of feed of articles 20 to stacker 10 by transport 26 being less than the speed at which elevator 20 descends. Ski 55, under the influence of spring 64, accordingly swings back in a clockwise direction. Following predetermined movement of ski 55 in a clockwise direction, switch cam 61 opens elevator stop switch 63 to interrupt the energizing circuit to stack control relay 85. The circuit to clutch and brake coils 73', 74' respectively is therefore interrupted to disengage clutch 73 and apply brake. Elevator 12 is accordingly stopped and held in a stationary position. It is understood that the continued feed of labeled articles 20 onto elevator 12 with resulting increase in article stack size results in intermittent lowering of elevator 12 under the control of ski 55 in the manner described.

Counter 76 serves to control labeling system 3 including stacker 10 in accordance with the program setting thereof to provide stacks each comprised of a predetermined number of articles. On reaching the predetermined article count, counter 76 closes contact 76' thereof to actuate article feeder control relay 89. Relay contact 89'' is opened to interrupt the circuit to feeder disconnect solenoid 6. With de-energization the armature of solenoid 6 is interposed in the path of movement of depending latch arm 17 to uncouple latch 15 from slider 19 and stop feeder 4. At the same time, a second contact 89' of relay 89 closes to start timer 140 to delay initiation of the stacker ejecting cycle until articles left on transport 26 following stopping of article feeder 4 reach stacker 10.

It is understood that, following stopping of article feeder 4, sensor 75 responds to the interruption in the flow of articles to addressing machine 5, contact 75' opening to de-energize clutch coil 8' and stop labeling head 8.

Following the requisite delay, timer 140 closes contact 140' thereof to actuate elevator reset relay 88. Contact 88' of relay 88 completes a circuit to speed control relay 83 to close high speed motor contacts 83' thereof while opening low speed contacts 83''. Elevator drive motor 41 is accordingly switched from low to high speed.

At the same time, a second contact 88' of reset relay 88 completes a circuit to elevator clutch and brake coils 73', 74' to engage clutch 73 and release brake 74. Elevator 12 therefore descends at high speed.

As elevator 12 descends, elevator support bars 34 pass between and through bars 43 of stack interceptor 14 and the stack 22 of addressed articles on elevator 12 is transferred from elevator 12 onto interceptor 14. As elevator 12 nears the bottom of stacker 10, the elevator carriage 32 closes lower stop switch 92 to energize stop relay 93. Contact 93'' of relay 93 is opened to interrupt the circuit to reset relay 88 and de-

energize clutch and brake coils 73', 74' respectively. Clutch 73 is accordingly disengaged to uncouple elevator 12 from motor 41 while elevator brake 74 is applied. At the same time, holding contact 93' of stop relay 93 closes.

As elevator 12 moves through interceptor 14, carriage 32 momentarily closes ejector start switch 94 to energize ejector control relay 95. Relay contact 95' closes to energize ejector motor control relay 96. Relay contacts 96' complete a circuit to ejector drive motor 49. At the same time, relay contact 95' energizes feeder restart relay 97. Following a preset interval, relay 97 opens contact 97'' thereof, to de-energize feeder control relay 89 and close relay contact 89''. Closure of contact 89'' energizes solenoid 6 to re-engage drive latch 15 and restart article feeder 4.

Ejector motor 49 drives ejector 16 forward (in the direction of the solid line arrow), to bring the upstanding bars 44 thereof into contact with the rear of the article stack resting on interceptor 14 to slide the stack along interceptor bars 43 and onto discharge conveyor 24. Conveyor 24 carries the finished stack away.

With initial movement of ejector 16 forward, ejector reset switch 89 closes to maintain ejector motor control relay 96 energized following de-energization of ejector control relay 95 as will appear hereinafter. As ejector 16 nears article discharge conveyor 24, the ejector carriage 45 momentarily closes elevator reset switch 99 to energize elevator reset relay 100. Relay contact 100' completes a holding circuit through the normally closed elevator slowdown relay contact 103'' to relay 100. A second relay contact 100' completes a circuit to clutch and brake coils 86', 87' to engage clutch 86 and release brake 87 whereby elevator 12 moves upwardly at high speed. At the same time, the normally closed relay contact 100'' is opened to de-energize stop relay 93 and ejector control relay 95.

Ejector drive motor 49, which remains energized through reset switch 98, carries the ejector 16 back toward the ejector start position shown in the drawings. As ejector 16 reaches the ejector start position, the ejector carriage 45 opens ejector reset switch 98 to interrupt the circuit to ejector motor control relay 96. Contacts 96' of relay 96 are therefore opened to stop ejector motor 49. At the same time, opening of switch 98 resets feeder restart relay 97.

As elevator 12 means the top of stacker 10, carriage 32 thereof momentarily closes transfer switch 109 to complete a circuit to elevator stack relay 85. The several contacts 85' of relay 85 close to hold relay 85 and clutch and brake coils 73', 74' respectively energized.

It is understood that elevator 12 raises to a maximum height and thereafter begins to descend. As elevator 12 descends, carriage 32 thereof closes upper elevator control switch 102 to complete a circuit to elevator slowdown relay 103. Relay contact 103' closes to complete a circuit to motor brake relay 105. Normally closed relay contacts 105'' are opened to interrupt the circuit to elevator drive motor 41 while contact 105'' thereof closes to connect dissipating resistor 133.

At the same time, relay contact 105'' closes to start braking timer 142 and following a predetermined interval during which the internal brake of motor 41 slows elevator 12, timer 142 opens contact 142' thereof to interrupt the holding circuit to motor brake relay 105. Contacts 105'' of relay 105 accordingly close to restart elevator motor 41.

It is understood that the inertia of elevator 12 sustains additional movement of elevator 12 following de-energization of motor 41 and actuation of the internal motor brake. Accordingly, reset stop switch 102 is only held closed momentarily by the moving elevator carriage 32.

With energization of slowdown relay 103 through closure of control switch 102 by elevator 12, contact 103'' thereof is opened to interrupt the holding circuit to motor speed control relay 83 so that high speed motor contacts 83' open while low speed contacts 83'' close. Elevator motor 41 is accordingly switched to low speed and, on restarting of motor 41 following the braking interval imposed by timer 142, motor 41 drives

elevator 12 at low speed. With restart of motor 41, elevator 12 descends until elevator stop switch 63, which is controlled by the position of ski 55, opens to break the holding circuit to stack relay 85. With de-energization of relay 85, contact 85' opens to interrupt the circuit to clutch and brake coil 73', 74' and stop elevator 12. Stacker 10 is now ready for the next stacking cycle.

Where during the operation of stacker 10, the input of articles 20 thereto is such that elevator 12, under the control of ski 55, descends to a point where elevator 12 closes ejector start switch 94 before the predetermined article count is reached, an energizing circuit is completed through the normally closed speed control relay contact 83'' to over-stack safety relay 108. Relay 108 opens contact 108'' thereof to de-energize stacker control relay 81 and shutdown stacker 10. It is understood that although elevator 12, during the stack ejecting portion of the stacker operating cycle, momentarily closes ejector start switch 94 to initiate operation of stack ejector 16, the prior actuation of speed control relay 83 to switch elevator drive motor 41 from low to high speed opens contact 83'' thereof to preclude switch 94 from energizing over-stack safety relay 108 at that time.

Should an article jam occur on elevator 12, the rapid buildup in the article level height would overcome the normal low speed descent of elevator 12 under the control of stack height responsive ski 55 as described heretofore, and the supply of articles to elevator 12 would swing the entire stack height control assembly 18 upwardly in a counter-clockwise direction about cross shaft 59. As control assembly 18 lifts, system stop switch 120 is opened to interrupt power to the system control circuit to thereby shutdown the various operating components of addressing system 3 pending removal of the article jam.

It is also understood that in the event of a stacker malfunction, for example, failure of elevator 12 to descend in accordance with the buildup of stack height or premature ascent of elevator 12 with articles stacked thereon, will also trip stop switch 120 as described above to shutdown addressing system 3.

While the invention has been described with reference to the structure disclosed herein, it is not confined to the details set forth; but is intended to cover such modifications or changes as may come within the scope of the following claims.

What is claimed is:

1. In an article processing system, the combination of: article addressing means including a labeling head for transferring address information to articles; means for supplying articles to be addressed to said addressing means; an article stacker for arranging addressed articles from said addressing means into stacks including a stacking elevator operatively disposed adjacent the discharge side of said addressing means to support addressed articles discharged by said addressing means; means to lower said elevator as the stack of articles thereon builds up; stacker reset means adapted when actuated to clear the article stack from said elevator and raise the cleared elevator into position for the next article stack; and control means for stopping said article supplying means to interrupt the flow of articles to said stacker while said stacker is being reset including means to delay actuation of said stacker reset means to give articles enroute to said stacker following stopping of said articles supplying means time to reach said stacker.
2. In an article processing system, the combination of: article addressing means including a labeling head for transferring address information to articles; means for supplying articles to be addressed to said addressing means; an article stacker for arranging addressed articles from said addressing means into stacks including a stacking elevator operatively disposed adjacent the discharge side of said addressing means to support addressed articles

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discharged by said addressing means; means to lower said elevator as the stack of articles thereon builds up; stacker reset means adapted when actuated to clear the article stack from said elevator and raise the cleared elevator into position for the next article stack; and
control means for stopping said article supplying means to interrupt the flow of articles to said stacker while said stacker is being reset;
said article addressing means including article transport means for bringing articles to be addressed from said article supply means into transfer relationship with said labeling head and thereafter to said stacker;

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said control means including means to stop said labeling head following addressing of the last article fed by said article supplying means prior to stopping thereof while maintaining said article transport means operative whereby to bring said last article to said stacker to complete the stack, and means to restart said article supplying means and said addressing means labeling head before resetting of said stacker is completed in order to have the first article addressed following restart of said article supplying means and said labeling head ready for stacking as resetting of said stacker is completed.

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