

Jan. 13, 1948.

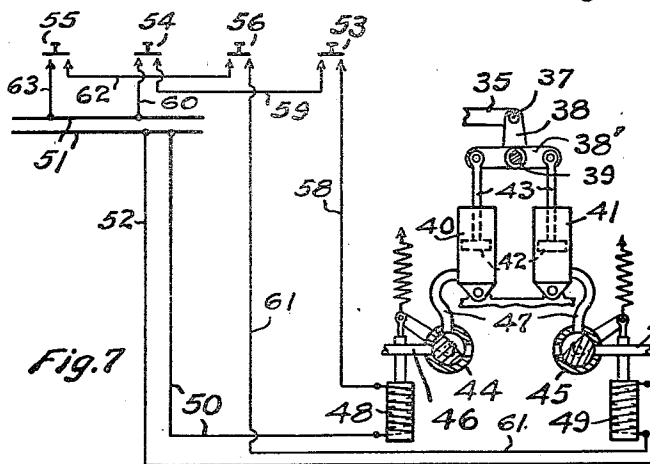
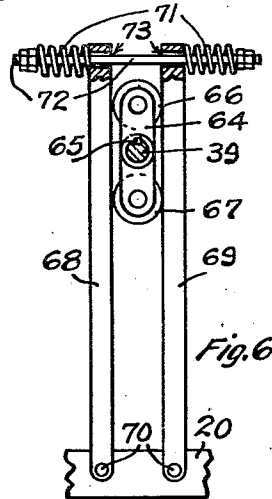
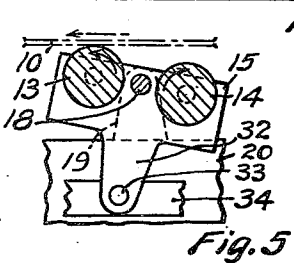
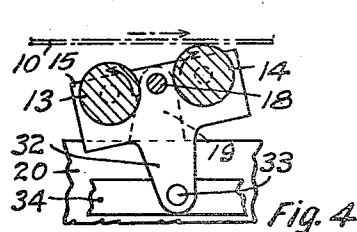
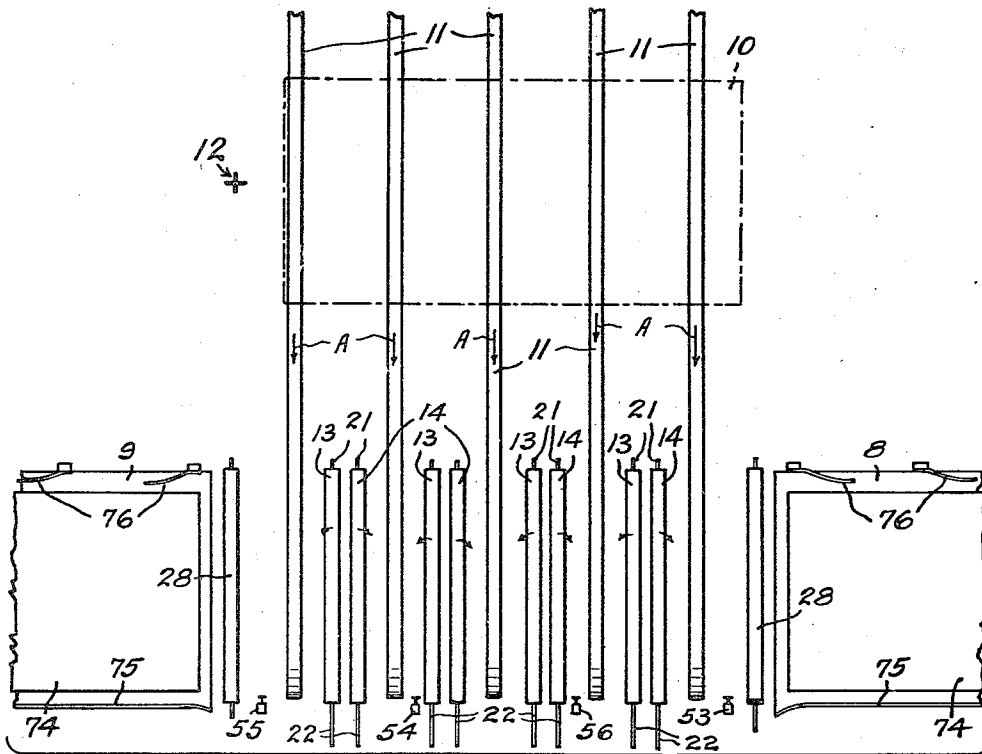
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2,434,411

SELECTIVE TRANSFER APPARATUS FOR PLYWOOD

Filed Dec. 28, 1945

2 Sheets-Sheet 1



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SELECTIVE TRANSFER APPARATUS FOR PLYWOOD

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2 Sheets-Sheet 2

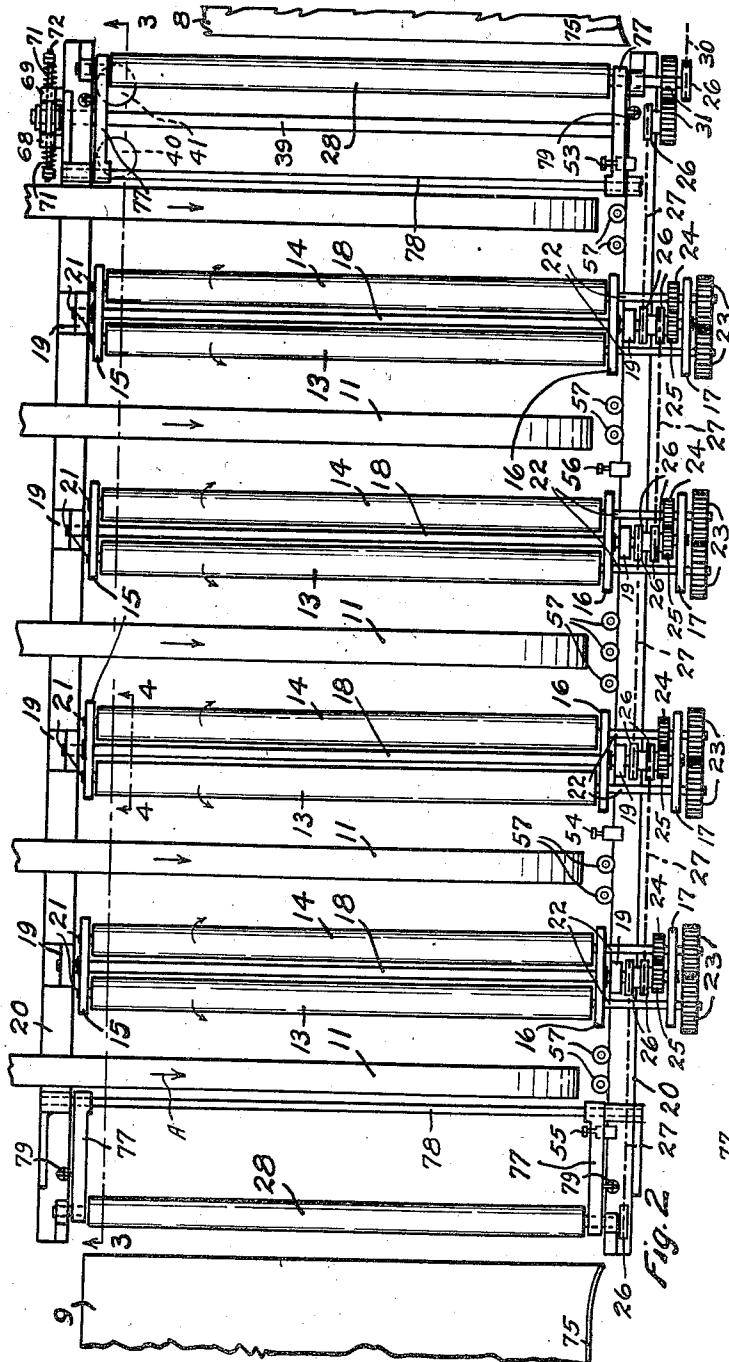


Fig. 2

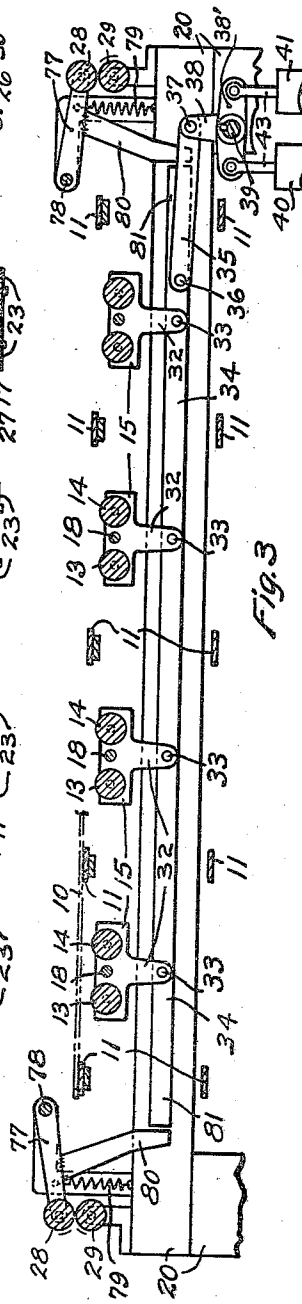


Fig. 3

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SELECTIVE TRANSFER APPARATUS FOR
PLYWOOD

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10 Claims. (Cl. 198—21)

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This invention relates to a selective transfer apparatus for use in the selective handling of plywood panels or other similar panels.

An object of this invention is to provide a selective transfer apparatus of simple and efficient construction that will save time and labor in the segregation of plywood panels in a line of production in a mill where plywood is being manufactured.

Another object is to provide selective transfer mechanism that will facilitate the grading of plywood panels in their process of manufacture.

Another object is to provide a selective transfer apparatus comprising pairs of rolls mounted for angular tilting movement and having the two rolls of each pair driven in opposite directions so that if said pairs of rolls are angularly moved in one direction one driven roll of each pair will engage with a sheet of plywood and lineally move the sheet in one direction and if said pairs of rolls are angularly moved in the opposite direction the other driven roll of each pair will engage with the sheet of plywood and lineally move said sheet in an opposite direction.

Another object is to provide efficient means responsive to the positioning of a panel for controlling the direction of discharge of the panel by the transfer means.

Another object is to provide novel and efficient automatic means for accurately positioning the panels as they are discharged from a selector table thereby preventing damage to the panels and providing for a more uniform stacking of the discharging panels.

Other objects of the invention will be apparent from the following description taken in connection with the accompanying drawings.

In the drawings

Figure 1 is a somewhat diagrammatic plan view of a selective plywood transfer means constructed in accordance with this invention, parts being omitted.

Fig. 2 is a plan view on a larger scale of selective transfer rolls embodied in this device with link belt driving means shown diagrammatically by dot and dash lines.

Fig. 3 is a view partly in elevation and partly in section of this device looking in the direction of broken line 3—3 of Fig. 2.

Fig. 4 is a fragmentary sectional view taken on broken line 4—4 of Fig. 2, and on a larger scale than Fig. 2, showing a pair of oppositely driven rolls in one operative position.

Fig. 5 is a view similar to Fig. 4 showing a different operative position of said rolls.

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Fig. 6 is a detached view partly in elevation and partly in section showing devices for controlling the tilting of the rolls.

Fig. 7 is a diagram illustrating electrical and fluid pressure devices for controlling the operation of driven rolls herein.

Referring to Fig. 1, veneer panels 10, shown by dot and dash lines, are carried in the direction indicated by the arrows A on endless traveling belts 11. These panels have been through the glue process and are to be graded before they pass to the next step in the process of manufacture. This next step may be sanding machines, or if the panels are defective they may have to undergo a patching process before passing to the sanding machines.

An attendant stands at the side of the traveling belts 11, as at the location 12. From this position he can observe the panels and determine how they are to be segregated.

A selective transfer table comprising a plurality of live roll transfer units is disposed in the line of travel of the panels 10 beyond the position of the attendant who does the grading. Each transfer unit comprises two parallel rolls 13 and 14 that are rotatively mounted in frame means which can be tilted so as to position said two rolls in the same horizontal plane or to selectively elevate either roll of the pair above the other roll.

Two bins 8 and 9 are provided at the respective ends of the selective transfer table formed by rolls 13 and 14. These bins are adapted to receive hand trucks 74 having flat platforms onto which the discharging panels are delivered. Preferably means are provided for raising and lowering the trucks in the bins to maintain the top of a growing stack of panels at a desired level. Preferably a straight guide member 75 is provided along one side of each bin and inclined yielding guide members 76 are provided along the other side of each bin.

The frame provided for the mounting of each set of oppositely driven parallel rolls 13 and 14 preferably comprises three frame members 15, 16 and 17 rigidly connected with each other by a bar or shaft 18. The shaft 18 is supported for oscillation in bearing brackets 19 that are secured to main frame members 20.

Each roller 13 and 14 has a short bearing shaft 21 protruding from one end thereof and journaled in the frame member 15. Also each roller 13 and 14 has a longer bearing shaft 22 protruding from the other end that is journaled in the frame members 16 and 17. The two longer bearing shafts 22 of each pair are parallel and are rota-

tively connected together for simultaneous rotation in opposite directions by two enmeshed gear-wheels 23.

One longer shaft 22 of each set of rolls such as the shaft 22 of each roll 14 is provided with a gearwheel 24 that meshes with another gearwheel 25. Each gearwheel 25 is rotatively mounted on the oscillating shaft 18 and is fixedly connected with preferably two sprocket wheels 26. A plurality of link belts 27, shown diagrammatically by dot and dash lines in Fig. 2 interconnect all of the sprocket wheels 26 for driving all of said sprocket wheels 26 in the same direction.

Two discharge or off-bearing rolls 28 and 29 are positioned one above the other at each end of the selector table formed by the pairs of rolls 13 and 14 and in the plane of discharge of the plywood panels. The lower roll 29 of one set of off-bearing rolls, such as the set shown at the right in Figs. 1, 2 and 3 is preferably driven by a link belt 30. The link belts 27 are preferably driven from this link belt 30 through gearwheels 31. The lower roll 29 of the pair of off-bearing rolls shown at the left in Figs. 1, 2 and 3 is preferably driven by one of the link belts 27.

Each frame composed of parts 15, 16, 17 and 18, together with the two rolls 13 and 14 carried by each frame, is arranged to be angularly moved or tilted on the axis of its shaft member 18. The tilting movement of each frame and set of rolls carried thereby is controlled by providing preferably on each of the frame pieces 16 and 15 a downwardly extending frame bracket 32, which serves as a lever. One set of brackets 32 is shown in Fig. 3, and the brackets at the other side are similar. All of the brackets 32 along each side of the machine are connected by pivots 33 with a tilt control bar 34. Each tilt control bar 34 is arranged to be longitudinally moved by a link 35. The links 35 each have one end portion connected by a pivot 36 with a tilt control bar 34 and the other end portion connected by a pivot 37 with a lever arm 38. Each lever 38 is secured to a shaft 39 that is journaled in the main frame 20. The shaft 39 is arranged to be oscillated by electrically controlled fluid pressure operated means preferably comprising two pneumatic cylinders 40 and 41 having therein pistons 42 connected by piston rods 43 with a cross bar 38' that is secured to said shaft 39.

Electrically controlled and operated valve means controls a supply of fluid under pressure such as compressed air to the cylinders 40 and 41. This valve means may be a standard four way solenoid operated valve. However, for the purpose of illustration two valves 44 and 45 are provided in connection with the respective cylinders 40 and 41. Air under pressure is supplied to each valve, as through a conduit 46. Other conduits 47, such as air hose, connect the valves 44 and 45 with the respective cylinders 40 and 41.

Valves 44 and 45 are respectively provided with suitable electrically actuated valve operating devices 48 and 49. Valve operating means 48 is connected by conductor 50 with one side of a source of electrical energy represented by conductors 51. Similarly valve operating means 49 is connected by conductor 52 with one side of the source of energy 51.

Four self-opening switches 53, 54, 55 and 56 are supported along the side of the selector table shown at the bottom in Figs. 1 and 2. These switches are adapted to be engaged by the leading edge portion of a veneer panel just prior to the time said leading edge portion encounters a

plurality of upright stop rolls 57 that are rotatively mounted in a line along the same edge of the selector table. When the edge of the veneer panel engages the switches it will close the switches that it engages and then be stopped by the rolls 57.

Conductors 58, 59 and 60 connect switches 53 and 54 in series with each other between valve operating means 48 and source of energy 51. Similarly conductors 61, 62 and 63 connect switches 55 and 56 in series between valve operating means 49 and source of energy 51.

The switch 53 is positioned in the path of the veneer panels near an end of the transfer table, shown at the right in Figs. 1, 2 and 3. The switch 55 is positioned near the other end of the transfer table, shown at the left in Figs. 1, 2 and 3. The distance between the two switches 53 and 55 is greater than the length of the panels 10 that are being handled so that it is not possible for one panel to close both of these switches at the same time. The operator standing at location 12 predetermines the switch to be closed by each panel 10 by moving said panel transversely on the belts 11. The two switches 54 and 56 are positioned at about equal distances between the end switches and control the breaking of circuits to valve control members 48 and 49.

When compressed air is admitted to one of the cylinders 40 or 41 all of the roller supporting frames will be tilted in the same direction to bring one driven roller 13 or 14 of each set into engagement with the bottom surface of the panel 10 that is positioned above said rollers. When one set of rollers is thus caused to engage the bottom surface of a panel 10 the panel will be lifted clear of the belts 11 and will be moved sidewise in a direction at right angles to the direction in which it has been moved by the belts 11. If the panel is engaged by the rollers 14 it will be moved in one direction, such as to the right, Figs. 1, 2 and 3. If said panel is engaged by the rollers 13 it will be moved in the opposite direction, such as to the left Figs. 1, 2 and 3.

Preferably spring means are provided to return the frames which carry the rollers 13 and 14 to a horizontal or non-tilted position as soon as the circuit controlling the valve 44 or 45 is broken. This means is shown detached in Fig. 6. Said means comprises a yoke 64 secured on the shaft 39 as by a key 65 and carrying two rollers 66 and 67. The rollers 66 and 67 are positioned between two spaced apart bars 68 and 69. The bars 68 and 69 each have one end portion connected with fixed frame means 20 by pivots 70. The bars 68 and 69 are yieldingly urged toward each other by compression springs 71 on a rod 72 that passes slidably through holes 73 in said bars. The springs 71 thus always exert a resilient force tending to return the shaft 39 to the same position. The levers 38, Fig. 3, that control the tilting of the frames that carry the rollers 13 and 14 are secured to the shaft 39.

Means are provided for holding each pair of off-bearing rolls 28 and 29 in spread apart relation while approximately the first half of a veneer panel is passing between a pair of these rolls on its way to a bin. During this first part of its travel between the off-bearing rolls the panel rests on the lower off-bearing roll 29. With the panel thus loosely held, when the leading end of said panel encounters the inclined resilient guide members 76 said panel will be pushed over against the straight side member 75 of the bin and be correctly aligned before the panel is en-

gaged by the top off bearing roll 28. This avoids damage to the panel such as can occur if the end or corner of a panel encounters the side of a bin while the panel is firmly held between two rolls. Also it helps in providing an even stack of panels on the truck onto which the panels discharge.

Preferably each upper off-bearing roll 28 is supported by arms 77 that are secured to a cross shaft 78. Spring means 79 is provided for yieldingly urging each upper roll 28 downwardly toward the lower roll 29 that is paired therewith. The means for lifting each upper roll 28 and holding the same elevated while the forward end portion of a panel is passing thereunder preferably comprises a downwardly extending lever arm 80 secured to each arm 77 and a bumper bar 81 secured to each end of each tilt control bar 34. Whenever the tilt control bars are moved to tilt the rollers 13 and 14 and discharge a panel the bumper bars 81 at the end where the panel is to discharge will lift the top off-bearing roll 28 before the end of the panel passes thereunder. When the trailing end of the discharging panel moves clear of the switch 54 or 56, depending upon the direction of movement of the panel, the rolls 13 and 14 will be moved back to a level position and the top off-bearing roll 28 will drop onto the panel to insure completion of the discharge of the panel.

In the operation of this selective transfer apparatus the operator, standing at location 12, watches the panels 10 as they move toward the selector rolls 13 and 14 on the belts 11. All panels in one grade or class are pushed away from the operator far enough so they will be clear of the switch 55. All panels in another grade will be pulled toward the operator far enough so that they will be out of line with the switch 53. Only a few inches of transverse movement of the panels 10 on the belts 11 is required to accomplish this purpose. When the leading edge portion of a panel 10, that has been pushed to the right, Figs. 1, 2 and 3, far enough to be clear of the switch 55, encounters the switches 53, 54 and 56 it will close said switches and the panel will come to rest against the stop rolls 57. The closing of switch 56 will be immaterial as this switch is in series with switch 55 which will be open. The closing of switches 53 and 54 will energize member 48 and supply compressed air to cylinder 40 to tilt the roller frames into the position shown in Fig. 4. The tilting of the roller supporting frames will cause the rollers 14 to lift the panel clear of the belts 17 and move said panel toward the bin 8. If the alignment of the panel on the rolls 14 is incorrect then the leading end of the panel will engage with the guides 76 and wall 75 of bin 8 and the faulty alignment will be corrected before the top roll 28 is lowered onto the panel. The switches 54 and 53 are both held closed until the trailing end of the panel has moved clear of said switches. As soon as the trailing end of the panel is clear of the switch 54 this switch is automatically opened thus breaking the circuit to the electrical control member 48. This allows the springs 71 to instantly tilt the rolls 13 and 14 back to a level position and further allows the roll 28 to drop onto the panel 10 and insures the proper discharge of the panel clear of the off-bearing rolls 28 and 29.

The operation is substantially the same as just hereinbefore described in transferring a panel, which has been positioned to clear the switch 53, into the bin 9 at the left in Figs. 1, 2, 3 and 7.

Under these conditions the switches 55, 54 and 56 will be closed. The closing of switch 54 will be immaterial but the closing of switches 55 and 56 will cause the rolls 13 to engage with the panel 10 and the panel will be delivered to the bin 9.

As soon as a transversely moving panel clears or releases either the switch 54 or the switch 56, in its sidewise movement, the released switch will open and the roller leveling mechanism shown in Fig. 6 will return the roller carrying frames to a level or non-tilted position with all of the rolls 13 and 14 below the plane of the belts 11 and clear of the next on coming panel.

Obviously changes may be made within the scope of the following claims:

I claim:

1. Selective transfer apparatus comprising panel supporting means; tilting frame means positioned beneath said panel supporting means; and two oppositely driven rollers carried by said frame means positioned for selective engagement with a panel by tilting movement of said frame means.

2. Selective transfer apparatus comprising panel supporting means; frame means supported for tilting movement beneath said panel supporting means; two oppositely driven transfer rollers carried by said frame means; and devices for tilting said frame means to selectively engage either of said rollers with a panel on said supporting means.

3. Selective transfer apparatus comprising frame means supported for tilting movement; two oppositely driven parallel spaced apart transfer rollers carried by said frame means; panel supporting means positioned to support a panel adjacent to and above said frame means and clear of said two rollers when said two rollers are in a substantially horizontal plane; and devices for tilting said frame means to selectively move either of said rollers into engagement with the panel and thereby move the panel in a direction determined by the direction of rotation of the roller in contact therewith.

4. Selective transfer apparatus comprising frame means supported for tilting movement; two oppositely driven parallel spaced apart transfer rollers carried by said frame means; panel transfer means operable to move panels into a position above said frame means and clear of said two rollers; devices yieldingly holding said frame means and rollers in a position clear of a panel on said panel transfer means; and selective devices operable to tilt said frame means and thereby engage either one of said rollers with a panel on said transfer means.

5. Selective transfer apparatus comprising a plurality of roller carrying frames supported for tilting movement in parallel spaced apart relation; two oppositely driven spaced apart parallel transfer rollers carried by each frame; panel moving means operable to move panels into a position above said frames; resilient means urging all of said frames and rollers into a level position clear of a panel on said panel moving means; and selective devices operable to tilt all of said frames simultaneously to selectively engage either roller in each frame with a panel on the transfer means.

6. Selective transfer apparatus comprising a plurality of traveling belts adapted to carry panels; a plurality of pairs of oppositely driven rollers positioned between the belts parallel with the belts and with the rollers below the plane of the panel supporting surface of the belts when the rollers are horizontally level; means for op-

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positely driving the two rollers of each pair; a frame rotatively supporting each pair of rollers; pivot means mounting each frame for tilting movement on an axis positioned between the two rollers of the pair; and means for tilting all of the frames to selectively engage the panel by the rollers rotating in one direction or by the rollers rotating in the opposite direction.

7. Selective transfer apparatus comprising a plurality of traveling belts adapted to carry panels; a plurality of pairs of oppositely driven rollers positioned between the belts parallel with the belts and with the rollers below the plane of the panel supporting surface of the belts when the rollers are horizontally level; means for oppositely driving the two rollers of each pair; a frame rotatively supporting each pair of rollers; pivot means mounting each frame for tilting movement on an axis positioned between the two rollers of the pair; means for tilting all of the frames to selectively engage the panel by the rollers rotating in one direction or by the rollers rotating in the opposite direction; a bin positioned at each side of the transfer table in alignment with the rollers; and a pair of off-bearing rollers near the inlet end of each bin.

8. Selective transfer apparatus comprising panel supporting and moving means; normally level frame means supported for tilting movement beneath said panel supporting and moving means; transfer rollers carried by said frame means operable to contact a panel when said frame means is tilted away from a normal level position; devices for tilting said frame means; two off-bearing rollers positioned one above another and positioned to receive therebetween panels moved by said first mentioned rollers; and devices responsive to the tilting of said frame means away from a level position for moving one

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of said off-bearing rollers away from the other off-bearing roller to provide selfadjusting travel therebetween of the leading end portion of a panel, and devices further providing movement of one off-bearing roller toward the other into engagement with the panel in response to the movement of said frame means.

9. Selective transfer apparatus comprising means for supporting and moving panels in one direction; a plurality of tilting frames positioned beneath the plane of the panel supporting surface of said panel supporting and moving means; two oppositely driven rollers carried by each frame; devices for tilting said frames to selectively move rollers that are rotating in either desired direction into engagement with panels; and means actuated by panels in their movement on said panel supporting and moving means for controlling the operation of said frame tilting devices.

10. Selective transfer apparatus comprising means for supporting and moving panels in one direction; a plurality of tilting frames positioned beneath the plane of the panel supporting surface of said panel supporting and moving means; two oppositely driven rollers carried by each frame; devices for tilting said frames to selectively move rollers that are rotating in either desired direction into engagement with panels; two panel operated electric switches controlling the operation of said frame tilting devices and positioned in the path of movement of panels on said panel supporting and moving means and spaced apart a distance greater than the length of the panels whereby the panels may be selectively positioned to operate one but not both of said switches.

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