A method and system for making a window well having a station with a first well area and a second well area, a conveyor to transport a first blank to the first well area, and a transport conveyor that transports a second blank to the second well area based on a signal from a sensor.
METHOD AND SYSTEM FOR MAKING A WINDOW WELL

BACKGROUND OF THE INVENTION

This invention is directed to a method and system of making a window well, and more particularly, to a method and system for making window wells of greater width.

The maximum height for basement window wells produced on the majority of today's production lines is 60 inches due to the maximum 72 inch coil width available commercially whereas 40% of the basement window well market requires wells 72 inches or higher. The only exception is one manufacturer that produces 72 inch high wells by seam welding two blanks together prior to being formed on one production line while another production line can produce 72 inch wells by overlapping and spot welding two blanks together. Either welding operation will destroy the galvanized coating in the weld areas and will require manually cleaning and painting the affected areas to restore the required corrosion resistance after the wells come off the production lines. Other manufacturers will manually join two panels off line after the wells are formed either by staking, spot welding the panels together or by joining two sections together with a joint as disclosed in U.S. Pat. No. 4,704,828. All these secondary operations are labor intensive, require special equipment and training and the case where the sections are joined by spot welding, the remedial paint touch up operation.

As a result, there exists a need in the art for a method and system that addresses these deficiencies.

An objective of the invention is that it provides for window wells greater in height than 60" without destroying a galvanized coating.

Another objective of the invention is to provide window wells that are less labor intensive to make.

A still further objective of the invention is to provide window wells manufactured with a minimal amount of equipment and training.

These and further objectives will be apparent to those skilled in the art based on the following disclosure.

BRIEF SUMMARY OF THE INVENTION

A method and system for making a window well having a station with a first well area and a second well area, a conveyor to transport a first blank to the first well area, and a transport conveyor that transports a second blank to the second well area based on a signal from a sensor.

Each well area has stops that position the first and second blank such that the top edge and bottom edge align along a centerline between the first and second well areas. A crimping roller is mounted above the centerline and is moveable such that the roller engages the edges of the blanks to interlock the edges in a mechanical joint. Once interlocked, the blanks are transported to a plate roller where corner radii are formed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of an assembly system;
FIG. 2 is a side view of an assembly system;
FIG. 3 is an end view of two blanks interlocked;
FIG. 4 is a perspective view of a station for an assembly system;
FIG. 5 is a plan view of a station for an assembly system; and
FIG. 6 is a perspective view of a station for an assembly system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the figures, the assembly line system is referred to generally by reference numeral 10. FIG. 1 shows an example of a system 10 for forming a window well product where material 12 is presented to the system 10 in a coil form. The system 10 may also be set up where material is presented as a blank feed or a retro fit. The system has a first station 14 having a de-coiler and a coil car. The material 12 is mounted on a mandrel and paid out as needed.

Station 16 is comprised of a material straightener and edge notch. As material is paid out from station 14, the material is straightened on the line and a notch is formed on both the top and bottom edge. A conveyor 18 transports the material 12 from station 16 to station 20. Station 20 includes a corrugation roll former and bends/presses the material 12 into a corrugated form. The corrugated material is transported from station 20, via conveyor 22, to station 24. Station 24 has an edge profile roll former that simultaneously forms the top and bottom edge profile.

From station 24, the material is transported via conveyor 26 to station 28. At station 28 the material 12 has a portion flattened to produce a mounting flange and then holes are punched in the flange. From station 28, the material is transported via conveyor 30 to station 32. At station 32, the material is sheared from the coil and the mounting flanges are bent. The system described to this point is conventional for the manufacture of a 60 inch window well.

At this point the top edge 34 of the material 12 has a female engagement profile 36 formed along its length as shown in FIG. 4. The opposite, or bottom edge 38 has a male engagement profile 40 formed along its length. The male profile 36 and female profile 40 are formed to interlock as shown by example in FIG. 3 to form a mechanical joint.

Upon exiting station 32, the sheared material or blank 42 is transported via conveyor to station 44. As shown in FIG. 5, a sensor 46 is positioned near station 44 and provides a signal to a controller 47 when the blank 42 approaches.

Station 44 has a first well area 48 and a second well area 50. The first well area 48 has a conveyor 52 and a transfer conveyor 54. Conveyor 52 preferably is a roller conveyor, and conveyor 54 preferably is a belt conveyor. Conveyor 54 is positioned between rollers on conveyor 52. Well area 48 also has a plurality of crowders 56 mounted to the conveyor 52 near the entrance of conveyor 52 and a plurality of pop-up stops 58 mounted to conveyor 52, opposite to the crowders 56. At the exit end of well area 48 are a plurality of pop-up stops 60. An overhead conveyor 61 is positioned at the entrance of conveyor 52.

Like well area 48, well area 50 has a roller conveyor 62 with a transfer conveyor 64 positioned between the rollers. A plurality of crowders 66 are mounted to conveyor 62 and a plurality of pop-up stops 68 are mounted to conveyor 62 opposite crowders 66. At the exit end of well area 50 are a plurality of pop-up stops 60. Also, a clamping system 70 is mounted adjacent to conveyors 62 and 64. The clamping system 70 is of many types including a plurality of electro magnets, weighted cylinders or a clasp that engages the edge of the blank 42. The sensor 46, conveyor 52, transfer conveyor 54, crowders 56, stops 58, stops 60, overhead conveyor 61,
conveyor 62, transfer conveyor 64, crowders 66, stops 68 and magnets 70 are all connected to and activated by controller 47.

In operation, a blank 42 is transferred from station 32 to conveyor 52 where it is detected by sensor 46. Once detected, pop-up stops 60 are raised to stop blank 42 when it reaches the exit end of conveyor 52. Once stops 60 are engaged by the blank 42, transfer conveyors 54 and 64 rise to lift and transfer blank 42 from conveyor 52 to conveyor 62. Once transferred, pop-up stops 68 rise and then crowders 66 are activated to push blank 42 against stops 68 to align the bottom edge profile 38 along centerline 72. Roller conveyor 62 further transports blank 42 such that it engages stops 60. Next, magnets 70 are moved to engage blank 42 and the magnets are energized to hold the blank 42 in place.

Once blank 42 is held in place by magnets 70, stops 68 are lowered as stops 58 are raised. A subsequent blank 42 is delivered to conveyor 52 and once detected by sensor 46, conveyor 52 is stopped. Once stopped, crowder 56 pushes the second blank against stops 58 such that the top edge profile is aligned with center line 72. Next, overhead conveyor 61 pushes the second blank along conveyor 52 such that the top edge 34 of the second blank 42 is slidably received in the bottom edge 38 of the first blank 42. Conveyor 61 pushes the second blank 42 until it engages stops 60.

Steps 58, 60 and 68 are lowered, the magnet 70 is de-energized, and overhead conveyor 61 pushes the first and second blanks 42 into a crimper roll 74 shown in FIG. 4 that is positioned to engage the blanks along edges 34 and 38 to interlock the panels and form a mechanical joint.

Once interlocked, the blanks 42 are transported via conveyor to station 74 shown in FIG. 6. Station 74 has a roller conveyor 76 and a sensor 78 to detect when the interlocked blanks 72 pass-by. Once the blanks pass sensor 78, conveyor 76 is stopped and a clamping system 80, mounted on a rail above the conveyor drops and clamps on to the back edge of the blanks 42. The clamping system is of many types including a plurality of electro magnets, weighted cylinders, a clasp that engages the back edge of the blank, or the like. The clamping system has an encoder 81 to determine distance traveled and the controller, from inputted information knows the length of the blanks. The clamping system 80 moves the blanks 42 along conveyor 76 a pre-determined distance into plate roller 82 where the blanks are released from the clamping system 80 and the plate roller 82 forms the corner radii on the blanks 42. The conveyor 76, sensor 78, clamping system 80, and plate roller 82 are all connected to and activated by controller 47.

Preferably, the plate roller with rolls is contoured to match the blank clamping system 80.

Once rolled, a pick-in-place mechanism 84 removes the formed window well from station 74 and transports the window well to station 86, which is a staging station for completed window wells.

Thus, a system and method of making a window well has been shown that at the very least meets all the stated objectives.

What is claimed is:
1. A system for making a window well, comprising:
a station having a first well area and a second well area;
a conveyor that transports a first formed blank to the first well area;
a transfer conveyor that transports the first blank to the second well area when activated by a signal from a sensor;
a conveyor that transports a second formed blank to the first well area,
stops that position the first blank and the second blank such that a top edge and a bottom edge align along a centerline between the first well area and the second well area; and
a crimping roller mounted above the centerline to engage the top edge and bottom edge of the first and second blank to interlock the top edge and the bottom edge.
2. A system for making a window well, comprising:
a conveyor for transporting two interlocked blanks;
a sensor for detecting when blanks have traveled a predetermined distance;
a clamping system that engages the blanks and transports the blanks to a plate roller where corner radii are formed.
3. A method of making a window well, comprising the steps of:
forming a first blank and a second blank;
interlocking the top edge of the first formed blank, with the bottom edge of the second formed blank; and
bending the interlocked blanks to form corner radii.

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