

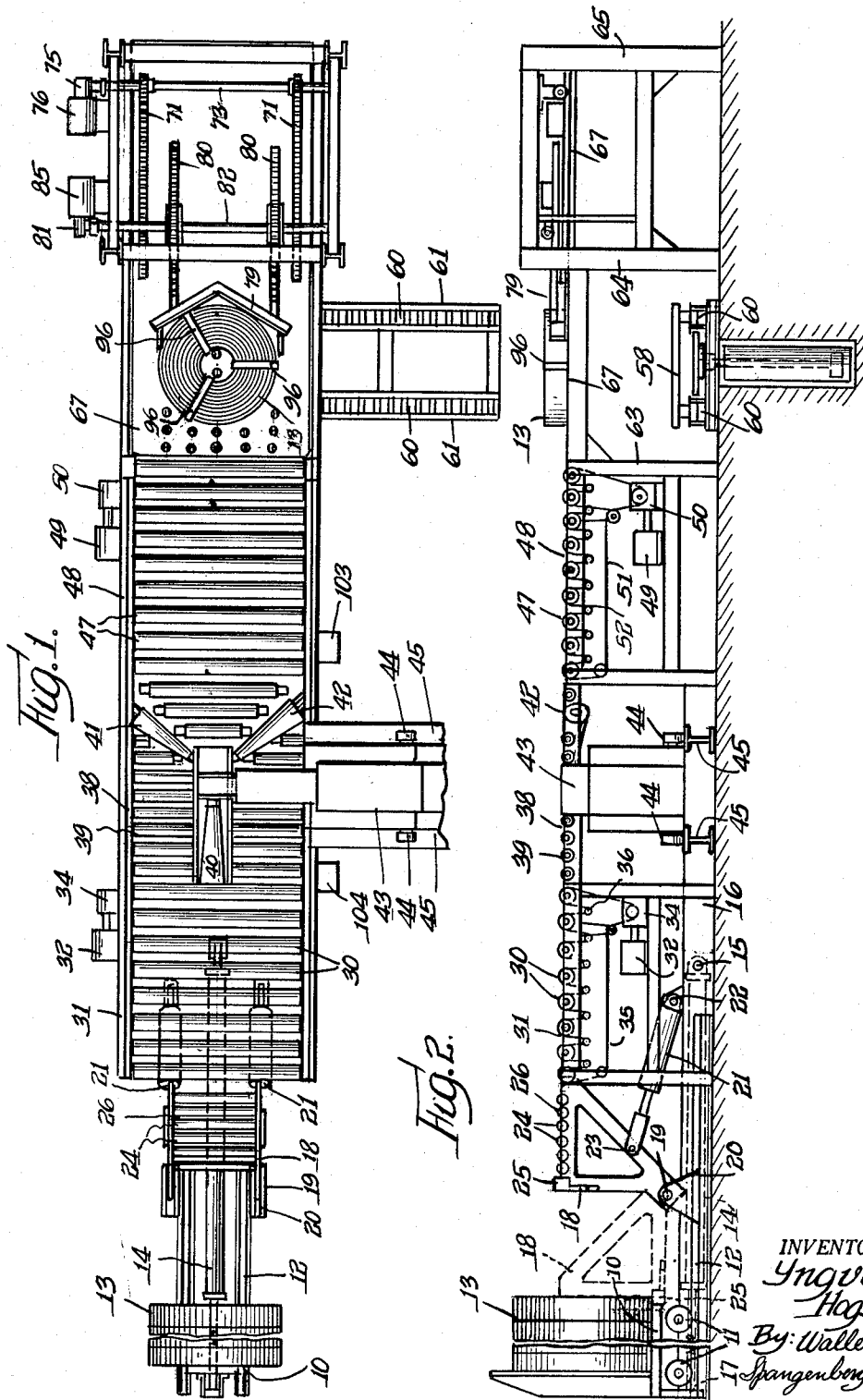
Sept. 8, 1964

Y. A. HOGSTEN
METHOD AND APPARATUS FOR BANDING COILS AND
STACKING BANDED COILS ON SKIDS

3,147,691

Filed Feb. 6, 1961

3 Sheets-Sheet 1



INVENTOR.

Yngve A.
Hoasten

By: Wallenstein
Spangenberg & Hatt
attys

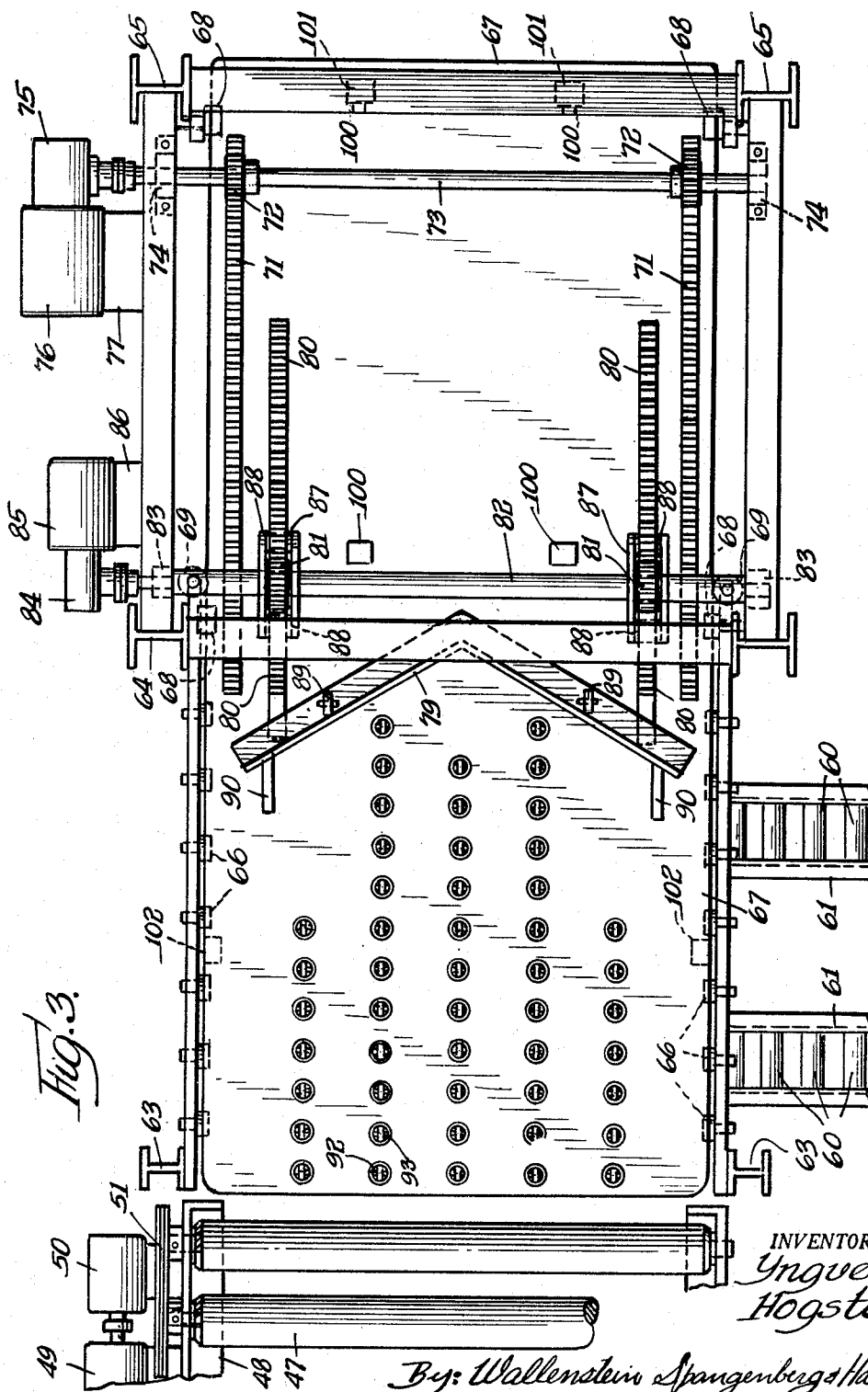
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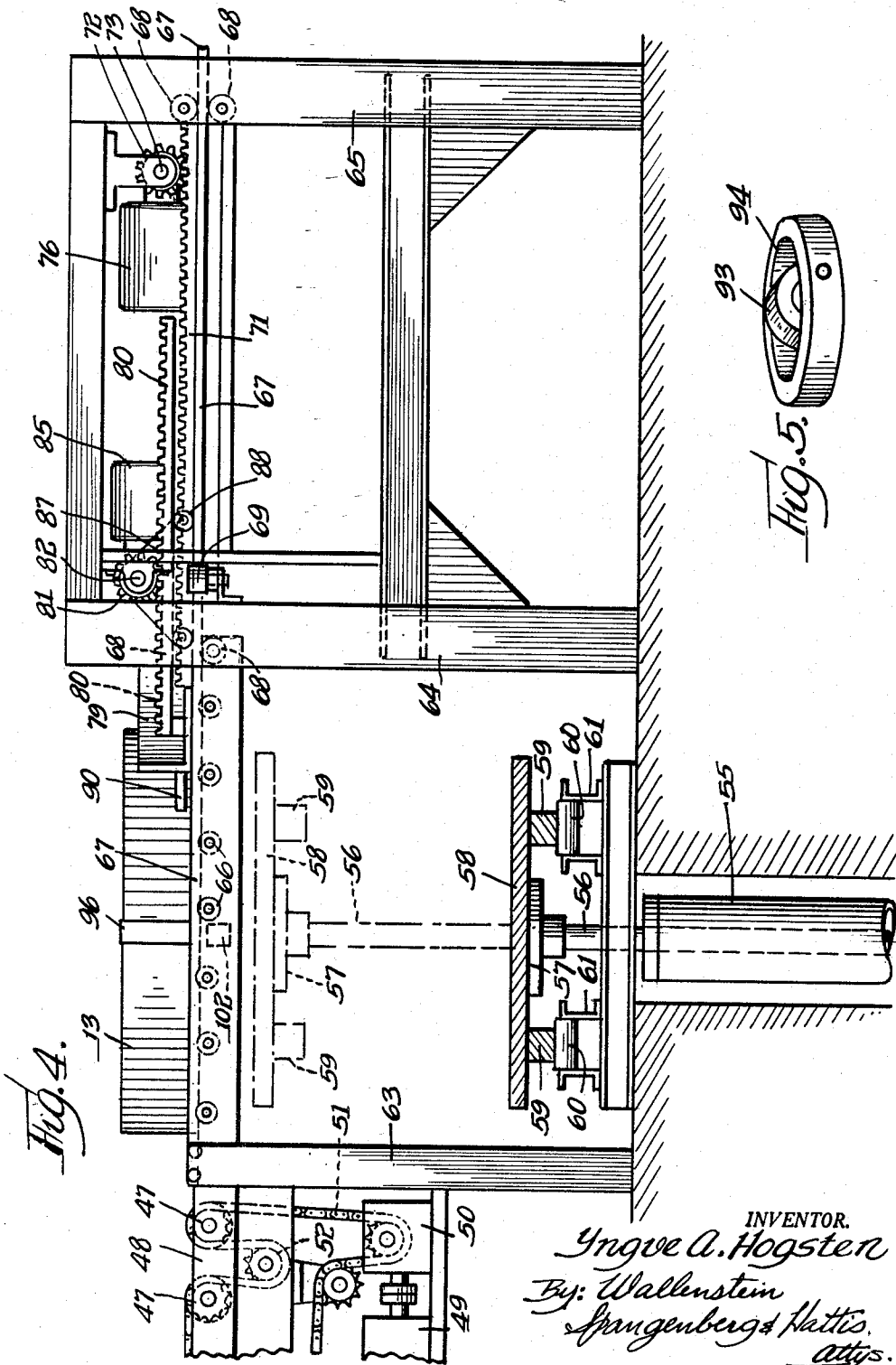
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INVENTOR.

Yngve A. Hogsten
By: Wallenstein
frangenbergs Hattis.
attys.

1

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METHOD AND APPARATUS FOR BANDING COILS AND STACKING BANDED COILS ON SKIDS

Yngve A. Hogsten, 850 De Witt Place, Chicago, Ill., assignor, by mesne assignments, to Yngve A. Hogsten, Chicago, Ill., Leslie B. Kidwell, Oak Park, Ill., and Tholand, Inc., Sperryville, Va., a corporation of New York

Filed Feb. 6, 1961, Ser. No. 87,428
13 Claims. (Cl. 100-2)

The principal object of this invention is to provide a new and improved method and apparatus for handling and stacking banded coils or the like on skids wherein the stacking is accurately, quickly, simply and inexpensively accomplished with a minimum of labor.

In the forming and handling of banded metal coils, a large roll of metal sheet, such as sheet steel or the like, is unrolled and the sheet fed through a flattener, over a threading table and through a slitter for slitting the sheet into a plurality of narrow metal strips of desired width which are coiled on an arbor of a recoiler. The coils are then removed from the recoiler, individually banded and placed on skids for stocking and/or use, considerable time and labor being required in so doing. It is this latter phase of this operation with which this invention particularly pertains.

In accordance with this invention, the coils are removed from the recoiler onto a coil cart with the coils vertically arranged. The coil cart is moved to an upender mechanism which removes the coils one at a time from the coil cart, upends them and feeds them one at a time horizontally onto a power driven roll conveyor, the coil cart advancing as the coils are removed therefrom. The conveyor advances the coils one at a time to a banding machine which bands the coils. The banded coils are then advanced one at a time by a power driven roll conveyor from the banding machine to a skidding machine which stacks the banded coils on skids for purposes of stocking and/or use.

The banding machine is preferably operated by an operator, and the advancing of the coil cart, the operation of the power driven roll conveyors and the operation of the skidding machine are accomplished automatically by suitable control equipment under the supervision of the operator of the banding machine. The only other operators needed are one who moves the coils to the upender mechanism (an operator of the slitting and recoiling machines) and one who operates a lift truck for supplying empty skids to the skidding machine and removing and transporting skids from the skidding machine which are automatically stacked with the banded coils. Thus, it is seen that time and labor is kept at a minimum.

An important aspect of this invention, which makes the aforementioned automation with minimum labor possible, is the method of stacking the banded coils on the skids and the construction and operation of the skidding machine for so doing. Briefly, in this connection, there is provided an elevator which raises and lowers a skid carried thereby, and a horizontally arranged table which is longitudinally movable between an advanced position above the elevator and a retracted position away from above the elevator. The power driven roll conveyor feeds a banded coil onto the table when the table is in advanced position. A stop member is arranged above the table for vertically centering the banded coil on the table with respect to the elevator.

Operating means for the elevator raises a skid carried thereby to a point just below the table, and operating means for the table retracts the table to cause the banded coil thereon to be centered by the stop member and centrally deposited on the raised skid. Thereafter, the oper-

2

ating means for the elevator lowers the elevator a distance corresponding to the thickness of the banded coil deposited on the skid, and the operating means for the table advances the table to receive another banded coil from the power driven roll conveyor to be centered and deposited on the previously deposited banded coil. This procedure is repeated until the desired number of banded coils are stacked on the skid. The elevator is then completely lowered and the loaded skid is removed and replaced with an empty skid for stacking banded coils thereon. A transversely extending roller conveyor is preferably utilized for removing and replacing the skids.

The stop member preferably includes a V-shaped surface which is engaged by the banded coil as the table is retracted so as accurately to center the banded coil both longitudinally and transversely as it is deposited on the skid, and the stop member is also preferably longitudinally adjustable so as to accommodate and accurately center banded coils of different diameters. The longitudinally movable table is also preferably provided with a plurality of rollers for rollingly supporting the banded coils fed thereon by the power driven roll conveyor.

Further objects of this invention reside in the method steps for stacking banded coils or the like on skids and in the details of construction of and the cooperative relationships between the component parts of the apparatus for stacking banded coils or the like on skids.

Other objects and advantages will become apparent to those skilled in the art upon reference to the accompanying specification, claims and drawings in which:

FIG. 1 is a top plan view of the apparatus of this invention illustrating the coil cart, the upender, the power driven conveyor, the banding machine, the power driven conveyor and the skidding machine including the elevator and the advanceable and retractable table;

FIG. 2 is a side elevational view of the apparatus illustrated in FIG. 1;

FIG. 3 is an enlarged plan view of the right hand portion of the apparatus illustrated in FIG. 2;

FIG. 4 is a side elevational view of the apparatus illustrated in FIG. 3; and

FIG. 5 is a perspective view of one of the rollers which may be carried by the table.

Referring first to FIGS. 1 and 2, a coil cart 10 provided with wheels 11 is movably carried on tracks 12, the coil cart 10 carrying coils 13 in vertical position as they are received from the arbor of the recoiler. The coil cart is moved on the tracks 12 from the recoiler to a point adjacent to an upender 18. A hydraulic cylinder 14 is connected at one end as indicated at 15 to a frame member 16 and is connected at the other end as indicated at 17 for advancing the coil cart with respect to the upender 18. As coils 13 are removed from the coil cart 10 by the upender 18, the hydraulic cylinder 14 operates to advance the coil cart 10 toward the upender 18.

The upender 18 includes a frame which is pivoted at 19 to a bracket 20 and it is moved between the solid line position and the dotted line position as illustrated in FIG. 2 by a pair of hydraulic cylinders 21 which are pivoted at 22 to the frame 16 and which are connected at 23 to the upender 18. The upender is provided with a plurality of rolls 24 and an adjustable pick-up member 25 which is disposed beneath a vertically arranged coil 13 on the cart 10. The hydraulic cylinder 21 of the upender then operates the upender from the dotted line position to the full line position as illustrated in FIG. 2 and the pick-up member 25 carries the coil 13 from the cart and horizontally arranges it adjacent a power driven conveyor having power driven rolls 30. To assist in maintaining the coil 13 on the upender as the coil 13 is being lifted from the vertical position to the horizontal posi-

3

tion, preferably, one of the rolls 24, such as the roll 26, is in the form of a magnet, the magnet operating to hold the coil 13 on the rolls 24. When the coil 13 is thus horizontally disposed on the power driven rolls 30, the coil is advanced thereby. The upender is then returned to the dotted line position and the cart advances a distance corresponding to the thickness of the coil 13 and subsequent coils are upended and supplied to the conveyor in the same manner.

The power driven rolls 30 of the conveyor are carried by a frame 31 and the rolls are driven by an electric motor 32 driving a gear reducer 34 which in turn drives a chain 35 which courses sprockets on the rolls 30 and idler sprockets 36. In this way, the power driven rolls 30 advance the coils as the coils are applied thereto by the upender. The horizontally arranged coils are fed by the power rolls 30 onto a banding machine 38 having a plurality of rolls 39 on the upper surface thereof. Also arranged on the upper surface of the banding machine are a plurality of conical rolls 40, 41 and 42 which operate to center a coil on the banding machine and to provide rotation thereof so that the coil may be banded at a number of places therearound. The banding machine includes a banding part 43 which is carried by rollers 44 on horizontally disposed tracks 45 so that the banding part may be inserted into and out of the banding machine as desired. The banding machine under the control of an operator applies a plurality of bands 96 to the coil. The banding machine per se is of the usual well known construction and, therefore, a further description thereof is not considered necessary. After the bands 96 are thus applied to the coils, the rollers 40, 41 and 42 are lowered to slide the banded coil onto another power driven conveyor having power driven rolls 47 carried by a frame 48. Here, also, the rolls 47 are driven by an electric motor 49 and a gear reducer 50 through a chain 51 coursing sprocket wheels on the rolls 47 and also idler rolls 52, this being shown more clearly in the left hand portion of FIG. 4. The power driven rolls 47 operate to convey the banded coils from the banding machine to the skidding machine shown in more detail in FIGS. 3 and 4.

The skidding machine includes an elevator having a hydraulic cylinder 55 embedded in the floor for raising and lowering a platform 57 through a piston rod 56. The platform 57 is adapted to engage underneath a skid 58 for raising and lowering the skid as illustrated by broken lines in FIG. 4. The skid 58 is provided with skid members 59 which ride on rolls 60 carried by a frame 61 when the platform 57 of the elevator is lowered to its lowest position. Thus, skids may be readily moved over or taken away from the platform 57 of the elevator.

The skidding machine also comprises a frame having uprights 63, 64 and 65. The frame carries a plurality of rollers 66 arranged above the elevator for movably receiving a table 67. The table 67 is also supported and guided by rollers 68 carried by the uprights 64 and 65 and by guide rollers 69 engaging the edges of the table. The table is movable between an advanced position as illustrated in FIGS. 3 and 4 where the table overlies the elevator and a retracted position wherein the table is moved away from over the elevator. The table 67 may be of any desired construction such as side members with rolls extending therebetween or as a solid plate as specifically illustrated herein. The table has a pair of racks 71 carried thereby which are engaged by pinions 72 carried by a shaft 73 rotatably mounted in bearings 74 on the frame. The shaft 73 is rotated through a gear reducer 75 by means of a reversible electric motor 76 carried by a bracket 77 which in turn is carried by the frame. Thus, as the electric motor 76 is rotated in one direction or the other, the table 67 is advanced and retracted.

A stop member 79 is arranged immediately above the table 67 adjacent to the elevator. This stop member 79 is in the form of a V and the V-shaped stop member 79

4

operates to center the banded coils on the table 67 above and with respect to the elevator. The V-shaped stop member 79 is carried by a pair of racks 80 which are engaged by pinions 81 carried by a shaft 82 which in turn is rotatably supported by bearings 83. The shaft 82 is rotated through a gear reducer 84 by a reversible electric motor 85 carried by a bracket 86 secured to the frame. A pair of hangers 87 are supported by the shaft 82 and these hangers are provided at their lower ends with rollers 88 for engaging the undersides of the racks 80. The rollers 88, therefore, operate to hold the racks 80 in engagement with the pinions 81 so that as the pinions 81 are rotated by the electric motor 85, the racks 80 and the stop member 79 are moved backwardly or forwardly. The stop member 79 is provided with a pair of rollers 89 which ride on the upper surface of the plate 67 so that the stop member 79 is maintained at a correct small distance above the reciprocable plate 67. The electric motor 85 is utilized for positioning the stop member 79 in the appropriate position for centering the banded coils above the elevator. Thus, the position of the stop member 79 is adjusted in accordance with the diameter of the banded coils to be stacked on the skid. Also, the V-shaped stop member 79 is provided at its ends with a pair of projections 90 which may be engaged by the banded coils if the banded coils are too far off center when delivered by the power driven rolls 47. These projections 90 give a rough centering action while the V stop member 79 gives an accurate centering operation. Preferably, the table 67, which is illustrated as in the form of a plate, is provided with a plurality of holes 92 which receive rings 94 which in turn carry small rollers 93, as illustrated more clearly in FIG. 5. These small rollers 93 operate to rollingly support the banded coils on the table 67 when the table is advanced.

In the operation of the skidding machine, when a skid 58 is interposed over the platform 57 of the elevator, the platform 57 is raised to raise the skid 58 to a point just below the table 67, the table then being in its advanced position as shown. A banded coil 13 having the bands 96 thereon is fed onto the advanced table 67 by the power driven rolls 47. The table 67 is then retracted from beneath the banded coil 13 and as the table is retracted, the V-shaped stop member 79 accurately centers the coil with respect to the elevator. When the table is completely retracted, the coil is deposited upon the elevated skid 58 in centered alignment with the elevator. The elevator is then lowered a distance corresponding to the thickness of the banded coil 13 deposited thereon and then the table 67 is moved from its retracted position to its advanced position for receiving another banded coil. The operation is then repeated and this banded coil is deposited on the previously deposited coil on the skid 58 in accurately centered relation. This procedure is continued until such time as the desired number of banded coils are deposited on the skid, the skid being lowered the appropriate amount after each coil is deposited. The skid with its coils deposited thereon is then lowered onto the rollers 60 of the transverse conveyor whereby the loaded skid may be readily removed from the skidding machine and replaced with an empty skid.

The table 67 is provided with abutments 100 which are adapted to engage limit switches 101 carried by the frame for controlling the reversible electric motor 76 to limit the extent of the advancing and retracting movement of the table. Carried by the frame of the skidding machine adjacent the elevator and immediately under the advanced table 67 are control switches 102 which may take the form of a photocell control device. These control switches 102 also control the electric motor 76 to prevent advance of the table 67 until such time as the last coil deposited on the skid 58 is lowered to a point below the table 67 so as to clear the table 67 for advance. Thus a faulty operation of the table 67 and jamming of the skidding machine is prevented. The control

5

switches 102 also operate to control the amount of the lowering of the elevator so as to keep at a minimum the distance which the coil 13 must fall for depositing onto the skid when the table 67 is retracted.

The operation of the entire apparatus is preferably carried on through a time sequence control, the coil cart 10 being intermittently advanced, the upender 18 being intermittently operated, the power conveyor rolls 30 and 47 being appropriately operated and the skidding machine being intermittently operated in timed relation in accordance with a desired time sequence. As the operator of the banding machine bands the coils as they pass by him in accordance with the time schedule, the remainder of the apparatus is automatically controlled. In the event that it should become necessary to change the timing of the operation of the skidding machine, this can be accomplished by the operator of the banding machine by manipulating suitable control equipment 103 adjacent the banding machine. Likewise, if it should be necessary to change the timing of operation of the upender and the coil cart, this may also be done by suitable control equipment 104 adjacent the banding machine. In view of the foregoing, it is apparent that a single operator may control the entire apparatus thereby greatly reducing manpower required in banding and stacking of the coils.

While for purposes of illustration, one form of this invention has been disclosed, other forms thereof may become apparent to those skilled in the art upon reference to this disclosure and, therefore, this invention should be limited only by the scope of the appended claims.

I claim as my invention:

1. A skidding machine for stacking banded coils on skids comprising, an elevator for raising and lowering a skid carried thereby, a horizontally arranged table longitudinally movable between an advanced position above the elevator and a retracted position away from above the elevator, means for feeding a banded coil onto the table when the table is in advanced position, a stationary stop member arranged above the table and having means for vertically centering the banded coil on the table with respect to the elevator, operating means for the elevator for raising a skid carried thereby to a point just below the table, operating means for the table for retracting the table to cause a banded coil thereon to be centered by the stop member and centrally deposited on the raised skid, said operating means for the elevator and table thereafter lowering the elevator a distance corresponding to the thickness of the banded coil deposited on the skid thereon and advancing the table to receive another banded coil to be centered and deposited on the previously deposited banded coil.

2. A skidding machine for stacking banded coils on skids comprising, a longitudinally extending supporting frame, an elevator arranged adjacent one end of the frame for raising and lowering a skid carried thereby, a horizontally arranged table movably carried by the frame and longitudinally movable between an advanced position above the elevator and a retracted position away from above the elevator, means for feeding a banded coil onto the table when the table is in advanced position, a stationary stop member carried by the frame above the table and having means for vertically centering the banded coil on the table with respect to the elevator, operating means for the elevator for raising a skid carried thereby to a point just below the table, operating means for the table for retracting the table to cause a banded coil thereon to be centered by the stop member and centrally deposited on the raised skid, said operating means for the elevator and table thereafter lowering the elevator a distance corresponding to the thickness of the banded coil deposited on the skid thereon and advancing the table to receive another banded coil to be centered and deposited on the previously deposited banded coil.

3. A skidding machine for stacking banded coils on skids comprising, a longitudinally extending supporting

6

frame, an elevator arranged adjacent one end of the frame and movable between raised and lowered positions, a transversely arranged conveyor adjacent the elevator for moving a skid over and away from the elevator when the elevator is moved to its lowered position, said elevator raising and lowering a skid moved thereover when the elevator is raised and lowered, a horizontally arranged table movably carried by the frame and longitudinally movable between an advanced position above the elevator and a retracted position away from above the elevator, a power driven conveyor for feeding a banded coil onto the table when the table is in advanced position, a stationary stop member carried by the frame above the table and having means for vertically centering the banded coil on the table with respect to the elevator, operating means for the elevator for raising a skid carried thereby to a point just below the table, operating means for the table for retracting the table to cause a banded coil thereon to be centered by the stop member and centrally deposited on the raised skid, said operating means for the elevator and table thereafter lowering the elevator a distance corresponding to the thickness of the banded coil deposited on the skid thereon and advancing the table to receive another banded coil to be centered and deposited on the previously deposited banded coil.

4. A skidding machine for stacking banded coils on skids comprising, an elevator for raising and lowering a skid carried thereby, a horizontally arranged table longitudinally movable between an advanced position above the elevator and a retracted position away from above the elevator, means for feeding a banded coil onto the table when the table is in advanced position, a stationary stop member arranged above the table and including a V-shaped surface engaged by the banded coil for vertically centering the banded coil on the table with respect to the elevator, operating means for the elevator for raising a skid carried thereby to a point just below the table, operating means for the table for retracting the table to cause a banded coil thereon to be centered by the stop member and centrally deposited on the raised skid, said operating means for the elevator and table thereafter lowering the elevator a distance corresponding to the thickness of the banded coil deposited on the skid thereon and advancing the table to receive another banded coil to be centered and deposited on the previously deposited banded coil.

5. A skidding machine for stacking banded coils on skids comprising, an elevator for raising and lowering a skid carried thereby, a horizontally arranged table longitudinally movable between an advanced position above the elevator and a retracted position away from above the elevator, means for feeding a banded coil onto the table when the table is in advanced position, a stationary stop member arranged above the table and including a V-shaped surface engaged by the banded coil for vertically centering the banded coil on the table with respect to the elevator, means for adjusting the longitudinal position of the stop member for accommodating and centering banded coils of different diameters, operating means for the elevator for raising a skid carried thereby to a point just below the table, operating means for the table for retracting the table to cause a banded coil thereon to be centered by the stop member and centrally deposited on the raised skid, said operating means for the elevator and table thereafter lowering the elevator a distance corresponding to the thickness of the banded coil deposited on the skid thereon and advancing the table to receive another banded coil to be centered and deposited on the previously deposited banded coil.

6. A skidding machine for stacking banded coils on skids comprising, a longitudinally extending supporting frame, an elevator arranged adjacent one end of the frame for raising and lowering a skid carried thereby, a horizontally arranged table, a plurality of rollers carried by the frame for movably supporting the table for longitudinal movement between an advanced position above the

elevator and a retracted position away from above the elevator, means for feeding a banded coil onto the table when the table is in advanced position, a stationary stop member pivotally carried by the frame above the table and having means for vertically centering the banded coil on the table with respect to the elevator, rollers on the stop member engaging the movable table for positioning the pivoted stop member with respect to the table, operating means for the elevator for raising a skid carried thereby to a point just below the table, operating means for the table for retracting the table to cause a banded coil thereon to be centered by the stop member and centrally deposited on the raised skid, said operating means for the elevator and table thereafter lowering the elevator a distance corresponding to the thickness of the banded coil to be centered and deposited on the previously deposited banded coil.

7. A skidding machine for stacking banded coils on skids comprising, a longitudinally extending supporting frame, an elevator arranged adjacent one end of the frame for raising and lowering a skid carried thereby, a horizontally arranged table in the form of a plate, a plurality of rollers carried by the frame for movably supporting the table for longitudinal movement between an advanced position above the elevator and a retracted position away from above the elevator, means for feeding a banded coil onto the table when the table is in advanced position, the portion of said table which receives the banded coil having a plurality of holes and a plurality of rollers mounted in said holes for rollingly supporting the banded coil on the table, a stationary stop member carried by the frame above the table and having means for vertically centering the banded coil on the table with respect to the elevator, operating means for the elevator for raising a skid carried thereby to a point just below the table, operating means for the table for retracting the table to cause a banded coil thereon to be centered by the stop member and centrally deposited on the raised skid, said operating means for the elevator and table thereafter lowering the elevator a distance corresponding to the thickness of the banded coil deposited on the skid thereon and advancing the table to receive another banded coil to be centered and deposited on the previously deposited banded coil.

8. A skidding machine for stacking banded coils on skids comprising, a longitudinally extending supporting frame, an elevator arranged adjacent one end of the frame for raising and lowering a skid carried thereby, a horizontally arranged table, a plurality of rollers carried by the frame for movably supporting the table for longitudinal movement between an advanced position above the elevator and a retracted position away from above the elevator, means for feeding a banded coil onto the table when the table is in advanced position, a stationary stop member pivotally carried by the frame above the table and having means for vertically centering the banded coil on the table with respect to the elevator, rollers on the stop member engaging the movable table for positioning the pivoted stop member with respect to the table, means for adjusting the longitudinal position of the stop member for accommodating and centering banded coils of different diameters, operating means for the elevator for raising a skid carried thereby to a point just below the table, operating means for the table for retracting the table to cause a banded coil thereon to be centered by the stop member and centrally deposited on the raised skid, said operating means for the elevator and table thereafter lowering the elevator a distance corresponding to the thickness of the banded coil deposited on the skid thereon and advancing the table to receive another banded coil to be centered and deposited on the previously deposited banded coil.

9. A skidding machine for stacking banded coils on skids comprising, a longitudinally extending supporting frame, an elevator arranged adjacent one end of the frame for raising and lowering a skid carried thereby, a horizon-

tally arranged table, a plurality of rollers carried by the frame for movably supporting the table for longitudinal movement between an advanced position above the elevator and a retracted position away from above the elevator, means for feeding a banded coil onto the table when the table is in advanced position, a stationary stop member pivotally carried by the frame above the table and including a V-shaped surface engaged by the banded coil for vertically centering the banded coil on the table with respect to the elevator, rollers on the stop member engaging the movable table for positioning the pivoted stop member with respect to the table, operating means for the elevator for raising a skid carried thereby to a point just below the table, operating means for the table for retracting the table to cause a banded coil thereon to be centered by the stop member and centrally deposited on the raised skid, said operating means for the elevator and table thereafter lowering the elevator a distance corresponding to the thickness of the banded coil deposited on the skid thereon and advancing the table to receive another banded coil to be centered and deposited on the previously deposited banded coil.

10. A skidding machine for stacking banded coils on skids comprising, a longitudinally extending supporting frame, an elevator arranged adjacent one end of the frame for raising and lowering a skid carried thereby, a horizontally arranged table, a plurality of rollers carried by the frame for movably supporting the table for longitudinal movement between an advanced position above the elevator and a retracted position away from above the elevator, means for feeding a banded coil onto the table when the table is in advanced position, a stationary stop member pivotally carried by the frame above the table and including a V-shaped surface engaged by the banded coil for vertically centering the banded coil on the table with respect to the elevator, rollers on the stop member engaging the movable table for positioning the pivoted stop member with respect to the table, means for adjusting the longitudinal position of the stop member for accommodating and centering banded coils of different diameters, operating means for the elevator for raising a skid carried thereby to a point just below the table, operating means for the table for retracting the table to cause a banded coil thereon to be centered by the stop member and centrally deposited on the raised skid, said operating means for the elevator and table thereafter lowering the elevator a distance corresponding to the thickness of the banded coil deposited on the skid thereon and advancing the table to receive another banded coil to be centered and deposited on the previously deposited banded coil.

11. The method of stacking banded coils on skids comprising the steps of, feeding a banded coil onto a table immediately above an elevated skid, retracting the table and simultaneously centering the banded coil with respect to the skid for centrally depositing the banded coil on the skid, lowering the skid a distance corresponding to the thickness of the deposited banded coil, advancing the table, and feeding other banded coils onto the advanced table and centering and depositing the same in the same way on the previously deposited banded coils to form the desired uniform stack of banded coils on the skid.

12. The method of handling, banding and stacking coils on skids comprising the steps of, removing a vertically disposed coil from a coil cart and upending the same to a horizontal position, banding the horizontally arranged coil, feeding the horizontally arranged banded coil onto an advanced table immediately above an elevated skid, retracting the table and simultaneously centering the banded coil with respect to the skid for centrally depositing the banded coil on the skid, lowering the skid a distance corresponding to the thickness of the deposited banded coil, advancing the table, and repeating the foregoing steps for banding and centering and deposit-

ing banded coils on the previously deposited banded coils to form the desired uniform stack of banded coils on the skid.

13. Apparatus for banding and stacking banded coils on skids comprising, a coil cart carrying a plurality of vertically disposed coils, a power driven conveyor, an upending mechanism for removing coils one at a time from said coil cart and upending and delivering the same horizontally to the power driven conveyor, a banding machine receiving coils from the conveyor and banding the same, a skidding machine including an elevator carrying a skid, an advancing and retracting table above the elevator and a stationary stop member above the table having means for vertically centering a banded coil on the table with respect to the elevator, a power driven conveyor for feeding banded coils from the banding machine onto the table when the table is advanced, means for retracting the table for engaging the stop member with a banded coil thereon for centering the banded coil and depositing the banded coil on the skid, and means for lowering the elevator and skid and advancing the table for receiving further banded coils and centering

and depositing the same on the previously deposited banded coils on the skid.

References Cited in the file of this patent

UNITED STATES PATENTS

5	2,059,177	Ohrn -----	Oct. 27, 1936
	2,565,927	Morgan -----	Aug. 28, 1951
	2,617,353	Ranney -----	Nov. 11, 1952
	2,700,332	Donald -----	Jan. 25, 1955
10	2,701,650	Stevenson -----	Feb. 8, 1955
	2,707,567	Bisset -----	May 3, 1955
	2,813,638	Miller -----	Nov. 19, 1957
	2,875,907	Locke -----	Mar. 3, 1959
	2,886,190	Beaulieu -----	May 12, 1959
15	2,917,884	Winkler -----	Dec. 22, 1959
	2,946,465	Raynor -----	July 26, 1960
	2,972,844	Ripley -----	Feb. 28, 1961
	3,028,979	Zachow -----	Apr. 10, 1962

FOREIGN PATENTS

20	1,093,326	France -----	Nov. 17, 1954
----	-----------	--------------	---------------