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W. F. MAY ET AL
CONVEYER WITH SHEET SUPPORTING
AND ANTIPINCHING DEVICE

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3 Sheets-Sheet 1

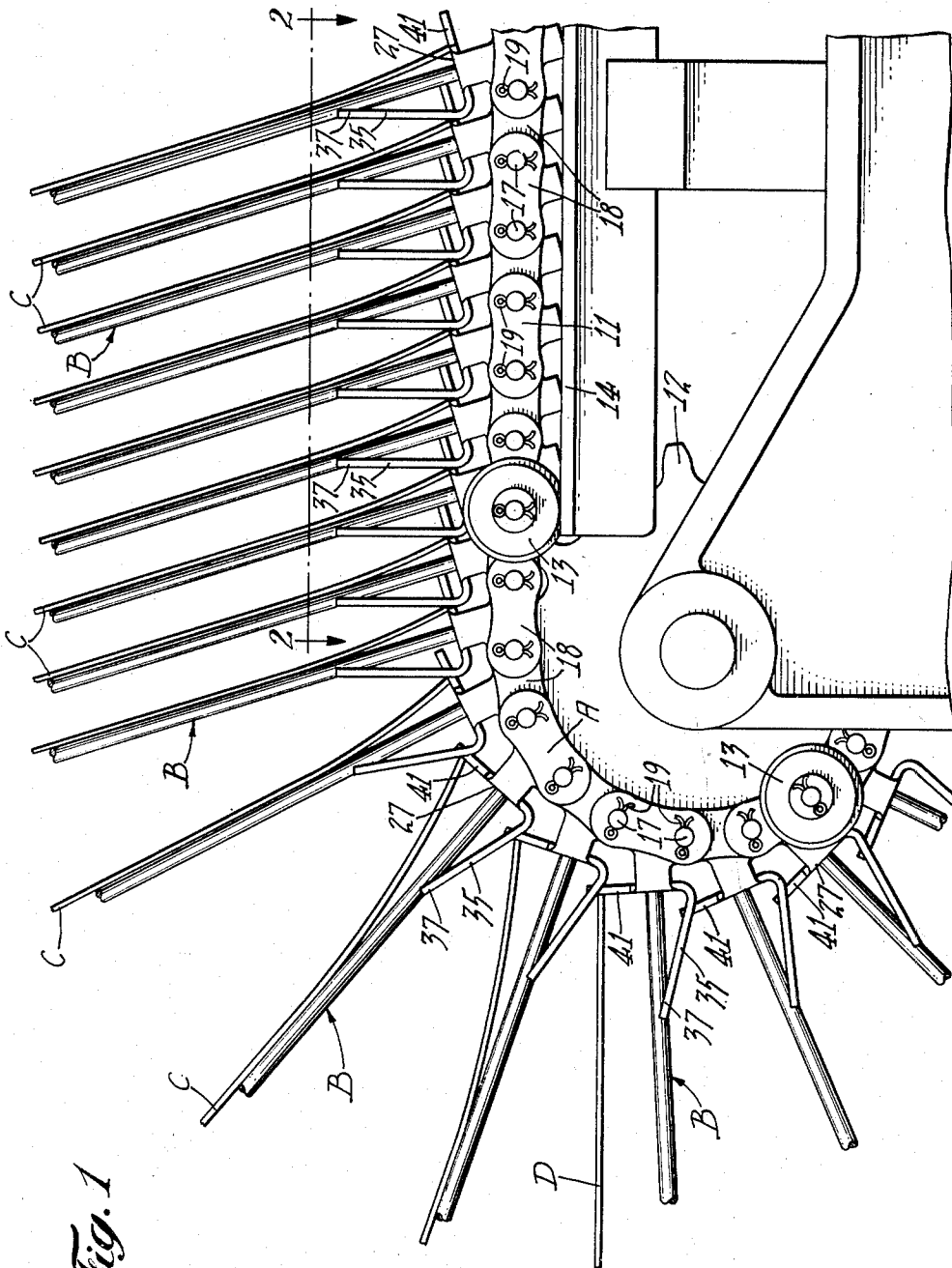


Fig. 1

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Fig. 2

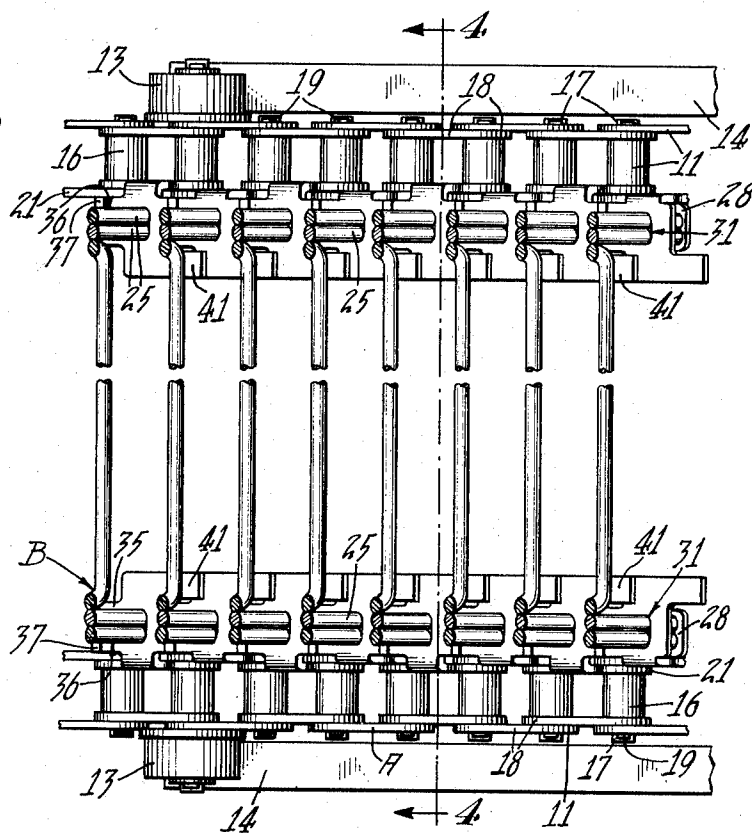
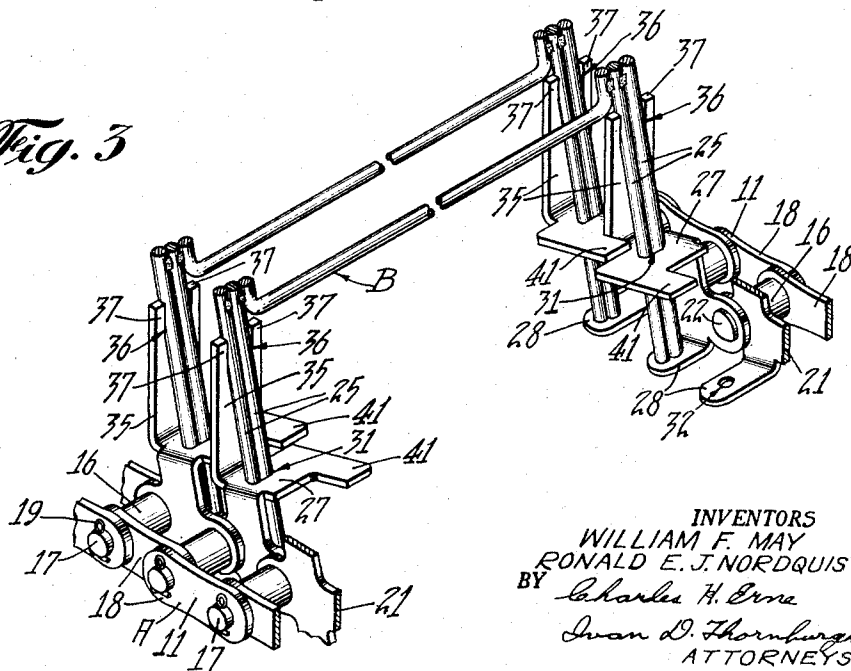


Fig. 3



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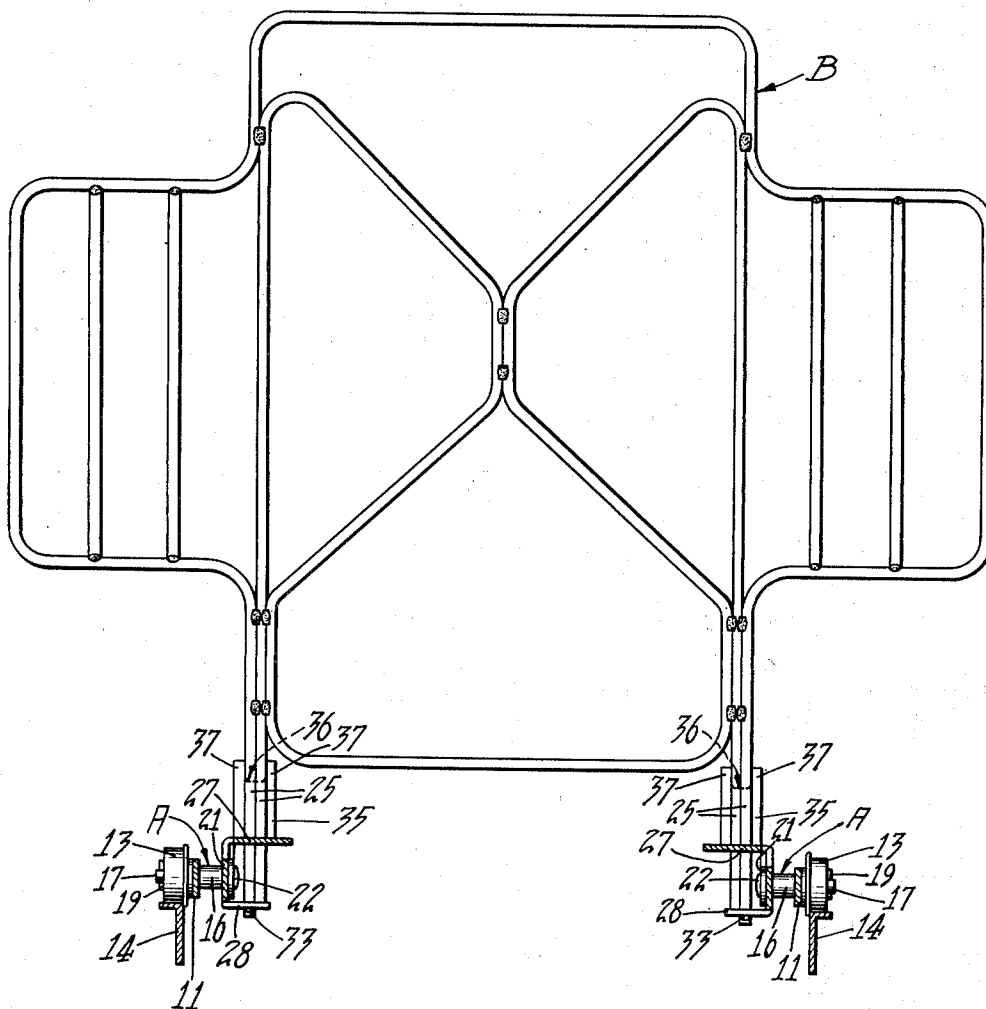
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Fig. 4.



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CONVEYER WITH SHEET SUPPORTING AND
ANTIPINCHING DEVICES

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6 Claims. (Cl. 198—134)

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The present invention relates to conveyors for ovens in which freshly coated sheets and the like are dried by heat and cooling treatments and has particular reference to devices for supporting the sheets and for protecting them against being pinched, scratched or marred during passage of the conveyor along a curved path of travel.

Conveyors for ovens usually are of the link chain type having upwardly extending wickets for supporting the coated sheets in an upright position. In many types of chain conveyors the links spread apart when passing around a curved path of travel, such as around a sprocket, and the sheets sometimes slip into the space between the spread links and become pinched. This damages the sheet so that it cannot be automatically fed from a stack for subsequent operations.

The instant invention contemplates overcoming this difficulty by providing a self-contained link which properly supports the sheet wicket and which provides for full support of the sheet edge so that the sheet edge cannot become pinched between the links.

An object of the invention is the provision of an oven conveyor chain carrying sheet supporting wickets wherein each sheet supporting link of the chain carries and fully supports its own wicket so that the wicket is free from support by any other link.

Another object is the provision of such a conveyor wherein adjacent sheet supporting links of the chain overlap each other in such a manner as to eliminate all spaces between the links so that the edge of the sheet is always properly supported and fully protected against being pinched when the links pass around a curved path of travel.

Another object is the provision of such a conveyor wherein adjacent links engage against each other in such a manner as to brace the chain against sagging between its supports.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a side view of a portion of an oven conveyor having sheet supporting links and wickets embodying the instant invention, with parts broken away;

Fig. 2 is a top plan view of the conveyor as viewed substantially along a plane indicated by

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the line 2—2 in Fig. 1, with parts broken away and parts shown in section;

Fig. 3 is a perspective view of the lower portion of a pair of adjacent sheet supporting wickets and the chain links immediately connected therewith, with parts broken away and parts shown in section; and

Fig. 4 is a transverse sectional view drawn at a reduced scale and taken substantially along the line 4—4 in Fig. 2.

As a preferred or exemplary embodiment of the instant invention the drawings illustrate a link chain conveyor A of the type used in lithograph drying ovens and the like. The conveyor carries a plurality of wickets B for supporting freshly coated or lithographed sheets C of tin plate or the like material in an upright or substantially upright on-edge position for passage through an oven.

The conveyor A includes a pair of spaced and parallel endless chains 11 (Figs. 1, 2, 3 and 4) which preferably operate over driving and idler sprockets, such as sprocket 12 (Fig. 1) located at the opposite ends of the oven. At spaced intervals along the length of the chains, rollers 13 are provided which travel along guide rails 14 and maintain the conveyor in a straight line path of travel.

The chains 11 preferably are of the roller type and include a plurality of spaced and parallel sprocket rollers 16 which are mounted on pivot pins 17. The outer ends of the pins extend through overlapping flat side links 18 of the character usually found in roller chains. Cotter pins 19 are provided in holes formed in the ends of the pivot pins to hold the links in place. This portion of the chain is a usual roller chain construction.

The inner portion of the chains 11 comprises a plurality of special or supplemental links 21, the ends of which are disposed in overlapping relation similar to the outer or side links 18. These inner links, like the outer links are mounted on the pivot pins 17 and are held in place by heads 22 formed on the pins.

A pair of opposed inner links 21 (one each on opposite sides of the conveyor) carry and fully support independently of any other pair of links an H shaped, rigidly re-enforced and welded wicket B which extends across the conveyor and which is preferably made of round wire material and having a pair of spaced and parallel double wire supporting legs 25 (Fig. 4) for attachment to the oppositely disposed links 21 on the two chains 11 of the conveyor. For this purpose each

inner link 21, as viewed in Fig. 3, is formed with a pair of vertically spaced and parallel support lugs, comprising an upper lug 27 and a lower lug 28. These lugs 27, 28 extend laterally inward from the links 21 and are tilted or disposed at an angle or inclined plane relative to the length of the inner links for carrying the wickets B in a rearwardly inclined position as shown in Figs. 1, 2, and 3. The invention is equally well adapted to a modified form of wicket having a single centrally located leg supported on a single chain conveyor.

The upper lug 27 is formed with a slot or opening 31 through which both of the wires of the wicket legs 25 extend while the lower lug 28 is formed with a hole 32 through which only the outer wire of the legs 25 extend. The terminal end of the other wire rests on top of the lug 28. A cotter pin 33 (Fig. 4) extends through the outer wire that extends through the lug 28 and thus locks the wicket in position.

As mentioned above, each wicket B is fully supported in its own pair of opposed carrying links 21 and is not dependent upon any other links. This support extends to a point above or beyond the links 21 so as to augment the support of the lugs 27, 28. For this purpose the back or follower edge of the upper lug 27 curves outwardly and upwardly and merges into a long vertically disposed or upright support arm 35 which extends up toward the rearwardly inclined wickets B.

The upper end of the support arm 35 is formed with a notch 36 of a width and depth to accommodate the width of the double wire legs 25 of the wicket. The defining edge of this notch 36 engages and vertically supports the legs 25 of the wicket and also this defining edge sets off two prongs 37 which extend up adjacent the outer surfaces of the wicket legs 25 and thus confine them against lateral displacement. The wicket is thus rigidly confined and supported.

When the inner links 21 of the twin chains 11 are in a straight line as when aligned along the upper run of the conveyor, the support arms 35 adjacent their lower ends, just above their curved wall extension of the lugs 27, engage against the leading edge of the lug 27 of the next adjacent link 21 and thereby adjacent links frictionally engage each other and support each other and thus prevent sagging of the chains 11 between their supporting rollers 13.

With this construction and support of the wickets B at sheet C supported by a wicket during its passage through an oven is retained in an inclined position against the wicket as best shown in Fig. 1 while its lower edge is fully supported by the lugs 27 of the two corresponding oppositely disposed inner links 21 of the twin chains 11. The lower supported edge of the sheet C usually sags forward in advance of the remainder of the sheet and rests against the back of the support arms 35 of the next adjacent link 21 as shown in Fig. 1.

In order to prevent the supported sheet edge from riding off the lugs 27 and falling into the space created between the edge of the lug and the back of the adjacent support arm 35 when the lugs 27 spread apart during passage of the links 21 around the sprockets 12, each lug 27 is formed with an extension or auxiliary supporting lug 41. This auxiliary supporting lug 41 is both a lateral and longitudinal extension of the lug 27 and is longer than the main body of the lug 27, being of sufficient length as shown in the

drawings to extend at the same angle of inclination as the lug 27 into overlapping relation with the next adjacent or advanced lug 27 in the chain. This auxiliary supporting lug 41 extends inwardly of and forwardly of the legs 25 of the next adjacent or advanced wicket B so as to laterally clear the legs 25 but also to never fall behind the support arm 35 no matter how far the lugs 27 may be spread apart (see Fig. 1).

Thus when the links 21 pass around the sprocket 12 at the inlet end of the oven as shown in Fig. 1, the space created between the lugs 27 by their spreading action is closed to the bottom edge of a sheet C, by the auxiliary supporting lugs 41 which span or bridge this space and extend forward far enough to pass beyond the adjacent preceding wicket support arm 35. Hence when a sheet C upon being loaded into the conveyor A is introduced between two adjacent wickets B in the position of the sheet marked D in Fig. 1, the leading edge of the sheet engages and is stopped by the auxiliary supporting lug 41 until the wicket immediately below the sheet moves up into engagement with it to support and carry the sheet through the oven.

This stopping of the sheet edge prevents its entrance into the space between the lugs 27 and thereby prevents the pinching, scratching or otherwise marring of the sheet between the lugs 27 when they again come together as they pass up into the upper run of the conveyor. The auxiliary supporting lug 41 continues to engage and support the sheet as the latter is advanced upwardly around the sprocket 12 and into the inclined position which it maintains while supported by the lug 27 during passage of the sheet through the oven.

In a similar manner, the auxiliary supporting lug 41 bridges the space created between the lugs 27 as they again spread apart during passage of the links 21 around the sprocket at the discharge end of the machine. In some cases discharge of the sheets is not effected until they pass down into the lower run of the conveyor. In such case the auxiliary lugs 41 continue to bridge the space between the lugs 27 to prevent pinching of the sheets at this end of the machine.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

We claim:

1. A conveyor for an oven for treating coated sheets, comprising in combination a chain formed with side links and supplemental links, a wicket carried on each of said supplemental links for retaining a received coated sheet in a substantially upright position, and a support arm carried on each of said supplemental links, the support arm of each supplemental link extending away from its link and at its terminal end formed with a notch engaging and partially surrounding the wicket carried by said link at a point beyond said link for confining the wicket laterally against shifting and for supporting the wicket on said link rigidly and in a predetermined position relative to said chain of links.

2. A conveyor for an oven for treating coated sheets, comprising in combination a chain formed with side links and supplemental links, a wicket

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carried on each of said supplemental links for retaining a received coated sheet in an upright position, and a support lug extending laterally from each supplemental link for providing a mounting for said wicket for supporting said sheet on edge, said lugs being inclined relative to the line of travel of the chain links, a higher part of each lug overlapping a lower portion of an adjacent lug for protecting the sheet against being pinched between the links when the chain passes around a curved path of travel.

3. A conveyor for an oven for treating coated sheets, comprising in combination a chain formed with side links and supplemental links, a wicket carried on each of said supplemental links for retaining a received coated sheet in an upright position, a support lug extending laterally from each supplemental link, and a support arm carried by each support lug, each support arm extending toward and engaging the wicket carried by its links at a point beyond for supporting the wicket rigidly and in a predetermined position relative to said chain of links, each of said support lugs having an edge portion engageable with the support arm of the next adjacent link for supporting said chain against sagging, each of said lugs also having an auxiliary support lug section projecting toward and extending beyond said support arm on the next adjacent link for supporting said sheet on edge and for protecting the sheet against being pinched between the links when the chain passes around a curved path of travel.

4. A conveyor for an oven for treating coated sheets, comprising in combination a pair of spaced chains having side links and supplemental links with pins connecting said links, each of said supplemental links having a pair of spaced laterally extending support lugs, a plurality of spaced wickets extending between said chains each wicket having a pair of supporting legs anchored in the support lugs of a pair of supplemental links for retaining received coated sheets in an upright position in spaced relation, and a support arm extending upwardly from each of said supplemental links, each support arm engaging and supporting one leg of the wicket anchored in said pair of supplemental links so that each pair of links fully supports its own wicket independently of the other links.

5. A conveyor for an oven for treating coated sheets, comprising in combination a pair of spaced chains having side links and supplemental

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links with pins connecting said links, each of said supplemental links having a pair of spaced laterally extending support lugs, a plurality of spaced wickets extending between said chains each wicket having a pair of supporting legs anchored in the support lugs of a pair of supplemental links for retaining received coated sheets in an upright position in spaced relation, a support arm extending upwardly from each of said supplemental links, each support arm engaging and supporting one leg of the wicket anchored in said pair of supplemental links so that each pair of links fully supports its own wicket independently of the other links, and an auxiliary support lug for each supplemental link, said auxiliary lug projecting laterally from one of said support lugs of each supplemental link and extending longitudinally of said chains and terminating beyond the support arm on the next adjacent supplemental link for supporting the sheet on edge and for protecting the sheet against being pinched between the links when the conveyor passes around a curved path of travel.

25 6. A conveyor for an oven for treating coated sheets, comprising in combination a pair of spaced chains each chain embodying corresponding outer side links and opposed inner supplemental links, a wicket mounted on each opposed pair of inner supplemental links for retaining a received coated sheet in a substantially upright position, inwardly extended upper and lower lugs formed integrally with said supplemental links, and a support arm formed integrally with and projecting upwardly from each upper lug, corresponding support arms on the two chains extending toward and engaging their associated wicket at a point above the wicket mounting for rigidly supporting the wicket in a predetermined position relative to said chains.

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