Aug. 20, 1946. G. J. DAWN 2,406,000

CONVEYER WICKET

Filed Sept. 2, 1944 3 Sheets-Sheet 1

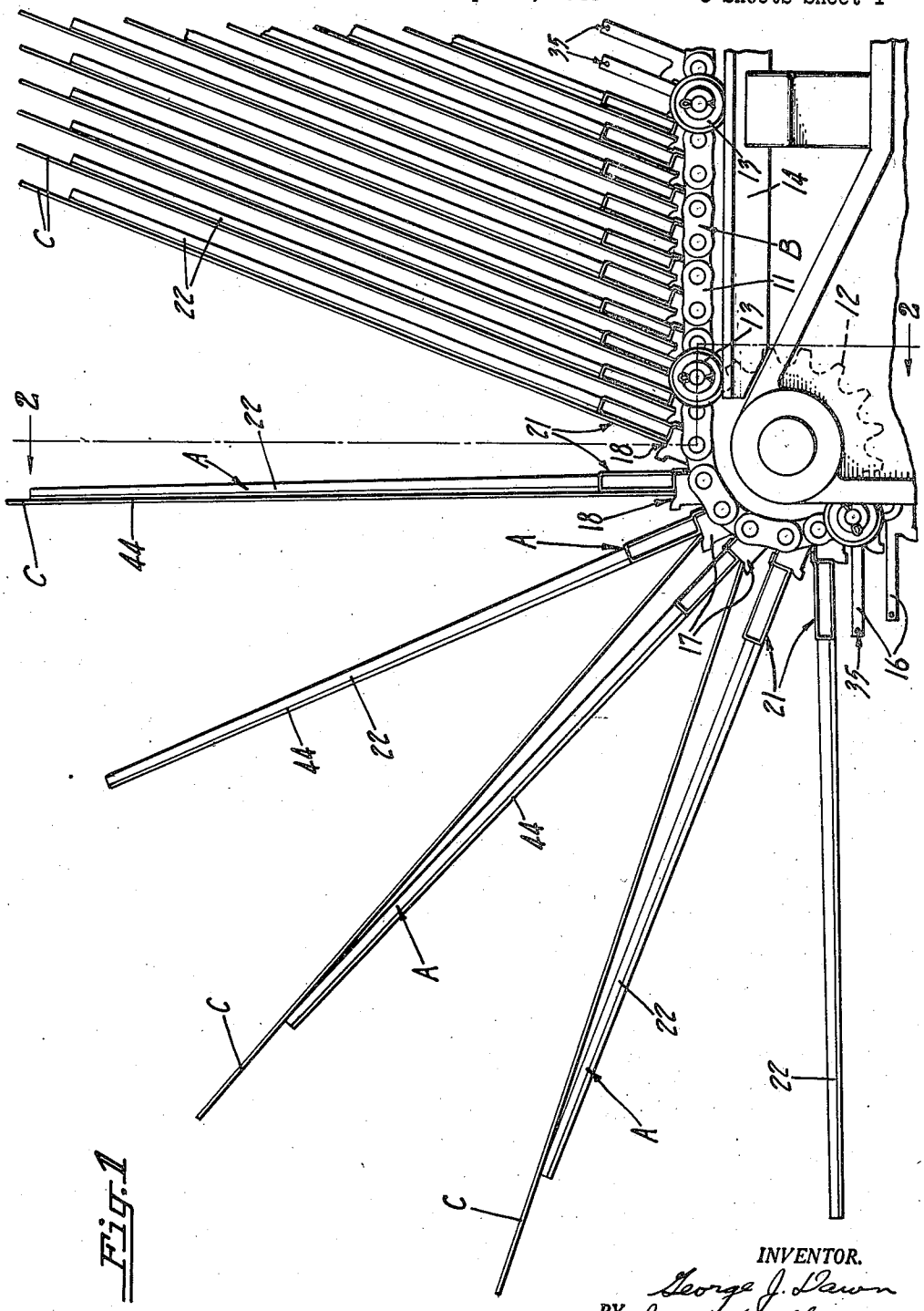


Fig. 1

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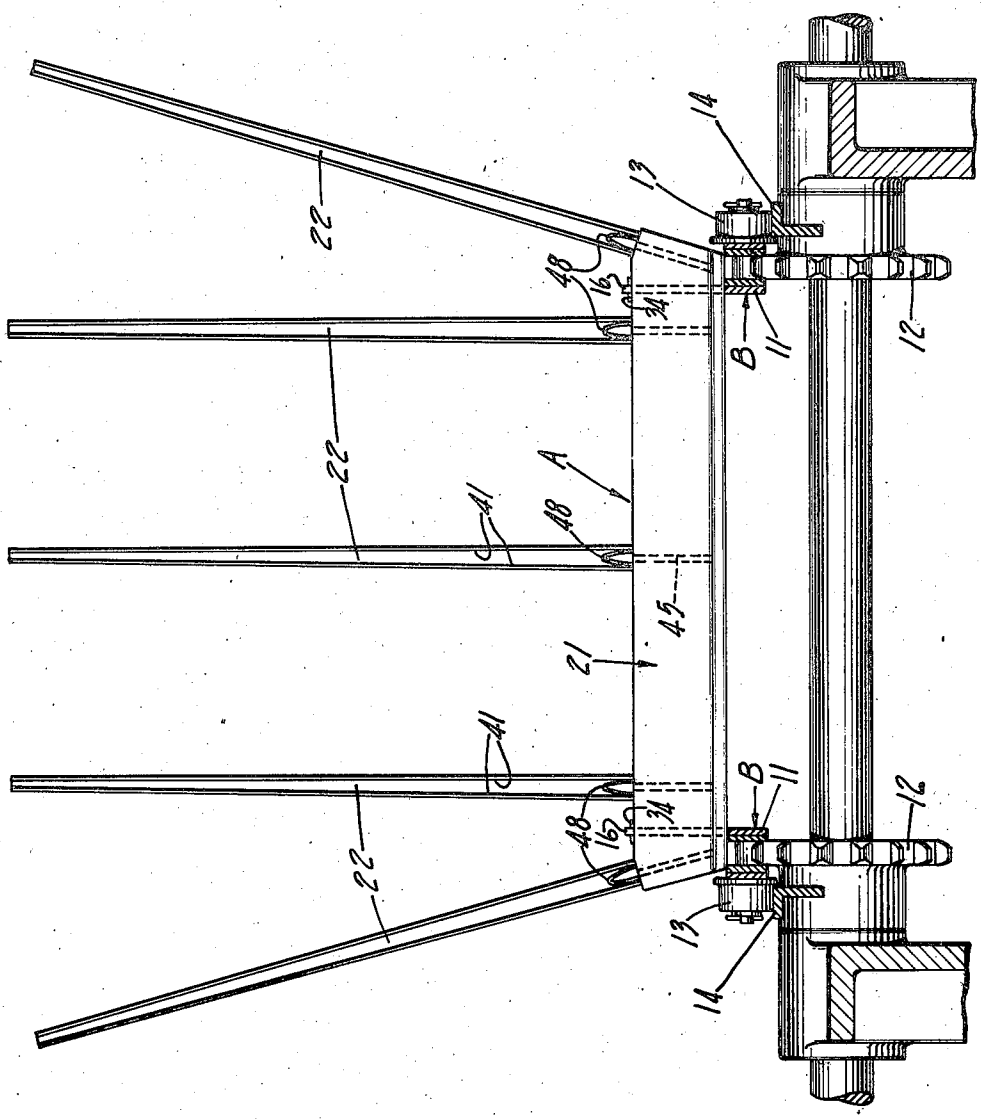


Fig. 2

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CONVEYER WICKET

Filed Sept. 2, 1944 3 Sheets-Sheet 3

Fig. 3

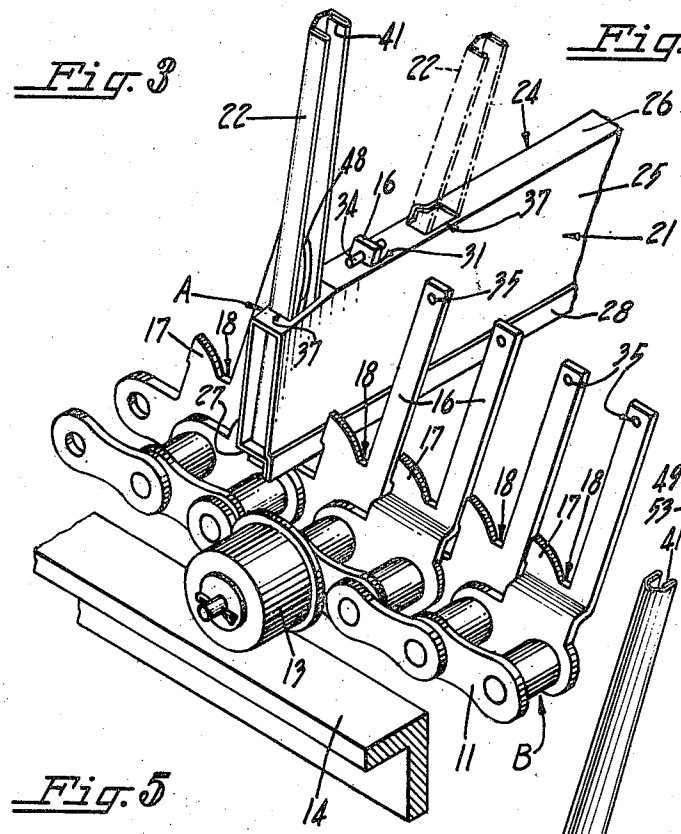


Fig. 4

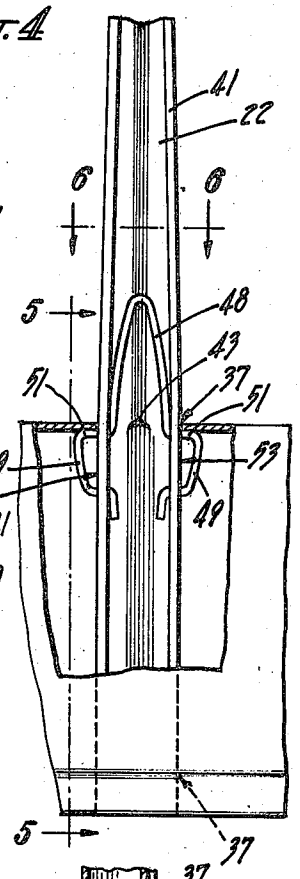


Fig. 5

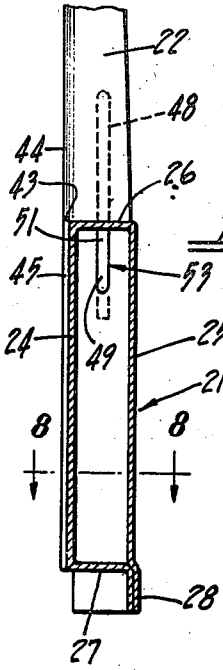


Fig. 6

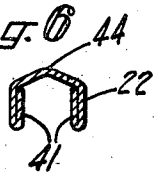


Fig. 7

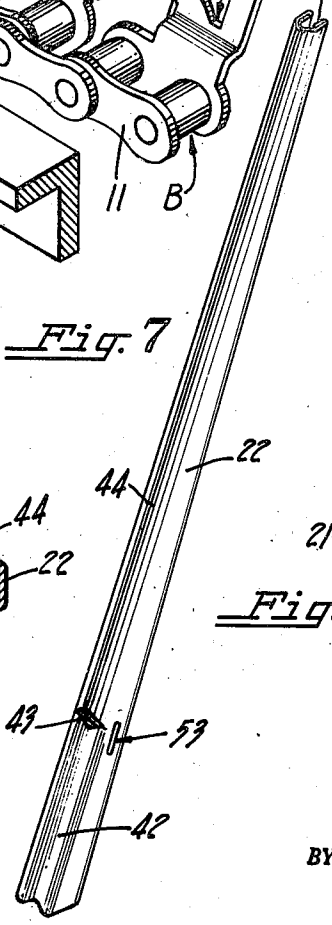
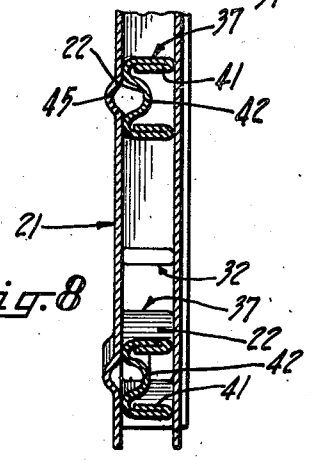


Fig. 8



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UNITED STATES PATENT OFFICE

2,406,000

CONVEYER WICKET

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Application September 2, 1944, Serial No. 552,505

17 Claims. (Cl. 198—134)

1

The present invention relates to conveyers for ovens in which freshly coated sheets and the like are dried by heat and cooling treatments and has particular reference to an improved wicket for supporting the coated sheets on the conveyer.

An object of the invention is the provision of an improved wicket for an oven conveyer wherein the wicket is formed so that the entire wicket may be quickly removed from the conveyer or any of its individual prongs may be readily detached and replaced whenever they become bent or otherwise damaged in the operation of the oven thereby eliminating prolonged shut-down of the oven for repairs to the conveyer wickets.

Another object is the provision of such a conveyer wicket wherein its various parts may be manufactured from light weight sheet material and by inexpensive die or stamping operations which are conducive to high speed construction and low cost.

Another object is the provision of a conveyer wicket of this character wherein its parts may be shipped and stored in a knock-down condition so that a minimum space will be required and may be quickly assembled on an oven conveyer to provide a sturdy support for the sheets.

Another object is the provision of such a conveyer wicket wherein its parts are rigidly locked together by simple locking means which permit of rapid and easy assembly and disassembly.

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 conveyer having sheet supporting wickets embodying the instant invention, with parts broken away;

Fig. 2 is a transverse sectional view taken substantially along the vertical line 2—2 in Fig. 1, with parts broken away;

Fig. 3 is an enlarged perspective view of a portion of the conveyer and a portion of a wicket, with parts broken away;

Fig. 4 is an enlarged detail of the wicket, with parts broken away;

Figs. 5 and 6 are respectively vertical and horizontal sectional views taken substantially along the lines 5—5 and 6—6 in Fig. 4;

Fig. 7 is an enlarged perspective view of one of the prongs of the wicket; and

Fig. 8 is a horizontal sectional view taken substantially along the line 8—8 in Fig. 5, with parts broken away.

2

As a preferred embodiment of the instant invention the drawings illustrate a sheet supporting wicket A (Figs. 1 and 2) for an endless conveyer B of the type used in lithograph drying ovens and the like. The conveyer includes a pair of spaced and parallel endless link chains 11 which are transversely connected by a plurality of closely spaced wickets A against which freshly coated metallic sheets C rest in a slightly inclined on-edge position for advancement through the oven.

The chains 11 preferably are of the roller type and operate over driving and idler sprockets 12 located at the opposite ends of the oven. At spaced intervals along the chains, rollers 13 are provided which travel on guide rails 14 which maintain the chains in a horizontal position. The inner links of the chains are formed with slightly inclined upright tongues 16 of rectangular cross-section which support the wickets A in a manner which will be hereinafter more fully explained. These links are further formed with flat arcuate shaped lugs 17 which engage against the edges of the adjacent tongues to prevent the chains from sagging between the rollers 13. Notches 18 formed in the lugs adjacent the base of the tongues in addition to holding a part of the wicket also receive and support the lower edge of the sheets resting against the wickets.

The wickets A preferably are made of light weight sheet metal and include a hollow tubular cross bar 21 and a plurality of detachable upright prongs 22 which are arranged on the cross bar in fan shape as shown in Fig. 2 so that they will fully support a coated sheet C resting against them.

The cross bar 21 extends across the conveyer from one chain to the other and is made from one piece of sheet material bent longitudinally of the bar to produce a body having a rectangular cross section, setting off flat front and rear wall sections 24, 25 (Figs. 3 and 5) and flat top and bottom wall sections 26, 27. The ends of the bar are open. At the junction of the rear wall section 25 and the bottom wall section 27 the marginal edges of the material are offset and overlapped to form a depending seam 28 of two thicknesses of metal which are bonded together in any suitable manner, preferably by welding.

The top and bottom wall sections 26, 27 of each cross bar 21 are formed respectively at their opposite ends with pairs of vertically aligned transverse slots 31, 32 (Figs. 3 and 8). These slots are

for reception of the tongues 16 of the conveyer. When a cross bar is in assembled position on the conveyer a tongue of the conveyer extends up from each side through its associated slot 32 in the bottom wall section, through the hollow cross bar, and projects above the bar through the corresponding aligned slot 31 in its top wall section. The bottom edge of the front wall section 24 adjacent the front end of the bottom slot rests on the conveyer link and is disposed in its notch 18.

With this construction of wicket cross bar, the entire wicket may be readily placed in position on the conveyer chains or may be readily removed by merely inserting the upper ends of the tongues 16 into the slots 32 in the bottom wall sections of the cross bar and slipping the bar down over the tongues. The cross bar is locked in place by a pin 34 which is inserted in a hole 35 formed in the upper end of each tongue and is disposed just above the top wall 26 (Figs. 2 and 3). These pins located one on each chain of the conveyer, may be readily withdrawn to unlock the cross bar and thus release it for removal of the entire wicket.

The top and bottom wall sections 26, 27 of the cross bar 21 are formed further with substantially square, substantially vertically aligned holes 37 for the reception of the prongs 22. The drawings show five of these holes in each of the top and bottom wall sections and spaced, as best shown in Fig. 2. The holes at the ends of the cross bar are angularly aligned so that the two end prongs will extend up in transversely inclined or fan shape. To facilitate this construction the top wall section 26 at the opposite ends of the cross bar slope downwardly and outwardly as shown in Fig. 2.

The prongs 22 of the wicket also are made preferably of sheet metal. These prongs have long and slender bodies, tapering slightly from their upper ends to their lower ends, the lower ends being approximately twice the width and twice the breadth of the upper ends. It is the lower end of each prong which is inserted into the holes 37 in the cross bar 21. In cross section the prongs are substantially U-shape, the marginal edges of the prongs being bent inwardly and back on themselves to produce smooth hems 41 (see Fig. 6). The face of the lower end of each prong, for a distance slightly greater than the height of the cross bar 21, is formed with a longitudinal inwardly bent head 42 (Figs. 7 and 8). This reenforces this end of the prong and makes it rigid and resistant to bending.

Above this reenforced section of the prong the bead 42 merges outwardly into a stop projection 43. The stop projection merges into an outwardly bent transversely tapered ridge 44 which extends along the prong to its extreme upper end. When the prongs are assembled with a cross bar these ridges cooperate with and form continuations of outwardly bent upright beads 45 formed in the front wall section 24 of the cross bar (see Figs. 5 and 8). These cooperating ridges and beads present a minimum surface to a sheet resting against a wicket and thus prevent the surface of the sheet from being scratched.

To assemble the individual prongs 22 with a cross bar 21 to form a complete wicket it is merely necessary to insert the lower ends of the prongs into the holes 37 in the top wall section 24 of the bar and slide the prong down through the bar and into the aligned hole in its bottom wall section until the stop projection 43 of the prong engages and rests on the top wall section of the cross bar. There are five prongs preferably for each wicket

and they are arranged as best shown in Fig. 2. The front and rear wall sections of the cross bar adjacent the spaced holes form a rigid support for the prongs.

The prongs 22 are preferably locked in their inserted position within the cross bar 21 so that they will remain in place when the conveyer carries the wickets into an inverted position as when traveling along a lower run of the conveyers. For this purpose each prong is provided with a stiff wire hairpin spring 48 (Fig. 4) which in general is elliptical in shape and open at one end. Near the ends, the elliptical sides of the spring are formed with outwardly and upwardly extending curved latch sections 49 which merge into straight inwardly extending locking sections 51 which terminate in the elliptical sides of the spring about midway of their length. The spring is disposed within the prong, with its straight locking sections 51 and curved latch sections 49 extending into and beyond vertical retaining slots 53 formed in the sides of the prong. The upper ends of these slots terminate in a transverse plane disposed slightly below the stop projections 43 of the prong.

When assembling a prong 22 with a cross bar 21 by insertion into the holes 37 of the bar, the curved latch sections 49 of the spring 48 engage and snap past the top wall section 26 of the bar as the prong is pushed down into place in the bar. This brings the straight locking sections 51 of the spring into position beneath the top wall section of the cross bar and in engagement with the inner surface of this wall section, as best shown in Fig. 4. The prong thus is held against displacement by its stop projection 43 engaging against the outer surface of the top wall section 26 of the cross bar and by the spring locking sections 51 engaging against the inner surface of the same top wall section. Hence the prong is effectively locked in the cross bar.

In case one or more of the prongs become bent or damaged while in use on the conveyer it is an easy matter to remove the damaged prongs and replace them with new ones without removing the entire wicket. This may be done merely by grasping the prong firmly and pulling it from the supporting cross bar 21, the spring 48 yielding sufficiently by slight deformation of the locking sections 51 of the spring. With the spring thus collapsed, the prong may be easily withdrawn and a new one inserted.

With this construction of cross bar and prong, these parts may be easily and quickly made in existing punch presses and the like and are readily shipped and stored in a knockdown condition. As explained above, assembly on a conveyer and replacement when damaged is one of the outstanding features of these novel wicket parts, these operations being effected rapidly and easily with the use of a few simple tools.

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.

I claim:

1. A sheet supporting wicket for use with oven conveyers, comprising in combination a hollow cross bar mountable on a conveyer, said cross bar having spaced top and bottom wall sections respectively provided with vertically aligned prong

receiving means thereon, and a plurality of separate prongs mounted on said cross bar in removable engagement with said prong receiving means and disposed in sheet supporting position, whereby said prongs may be readily replaced in a direction longitudinally of a said prong when the latter becomes bent or otherwise damaged while on the conveyer.

2. A sheet supporting wicket for use with oven conveyers, comprising in combination a hollow cross bar mountable on a conveyer, said cross bar having spaced top and bottom wall sections respectively provided with vertically aligned prong receiving means thereon, a plurality of separate prongs respectively mounted on said cross bar in removable engagement with both of said vertically aligned prong receiving means and disposed in sheet supporting position, whereby said prongs may be readily replaced in a direction longitudinally of a said prong when the latter becomes bent or otherwise damaged while on the conveyer, and locking means for each prong engaging one of said cross bar wall sections for holding the prongs against displacement from the cross bar.

3. A sheet supporting wicket for use with oven conveyers, comprising in combination a cross bar having a plurality of holes therein at spaced intervals along its length, said cross bar being mountable on a conveyer, a plurality of separate prongs removably mounted in the holes of said cross bar in sheet supporting position so that they may be readily replaced when bent or otherwise damaged while on the conveyer, and spring means carried by each of said prongs and engageable with the cross bar adjacent said holes for holding the prongs in place in said cross bar.

4. A sheet supporting wicket for use with oven conveyers, comprising in combination a hollow tubular cross bar mountable on a conveyer and extending transversely from side to side thereof, said cross bar having spaced top and bottom wall sections, and a plurality of separate elongated sheet material prongs of U-shaped reenformed cross section removably mounted on said cross bar in sheet supporting position and removably engaging both of said wall sections so that said prongs may be readily removed and replaced when bent or otherwise damaged while on the conveyer.

5. A sheet supporting wicket for use with oven conveyers, comprising in combination a cross bar having a plurality of holes therein at spaced intervals along its length and having an outwardly projecting bead extending transversely of said cross bar adjacent said holes, said cross bar being mountable on a conveyer, and a plurality of separate prongs removably mounted on said cross bar in sheet supporting position so that they may be readily replaced when bent or otherwise damaged while on the conveyer, said prongs having longitudinal ridges forming a continuation of the beads in said cross bar for supporting sheets in line contact.

6. A sheet supporting wicket for use with oven conveyers, comprising in combination a tubular cross bar having a plurality of holes therein at spaced intervals along its length and arranged in cooperating pairs disposed on opposing top and bottom wall sections of said cross bar, said cross bar being mountable on a conveyer, a plurality of separate prongs removably mounted in the holes in the cross bar in sheet supporting position so that they may be readily replaced when bent or otherwise damaged while on the conveyer, each prong extending through the cross bar and being

disposed within two of said oppositely located holes, and means for holding a said prong in mounted position on said cross bar.

7. A sheet supporting wicket for use with oven conveyers, comprising in combination a tubular cross bar having a plurality of holes therein at spaced intervals along its length and arranged in cooperating pairs disposed on opposing top and bottom wall sections of said cross bar, said cross bar being mountable on a conveyer, a plurality of separate prongs respectively removably mounted in the holes in the cross bar in sheet supporting position so that they may be readily replaced when bent or otherwise damaged while on the conveyer, each prong extending through the cross bar and being snugly fitted within two of said oppositely located holes for maintaining the prong against displacement, and a stop projection on each prong engageable with one of said wall sections of said cross bar for locating the prong in the cross bar.

8. A sheet supporting wicket for use with oven conveyers, comprising in combination a tubular cross bar having a plurality of holes therein at spaced intervals along its length and arranged in cooperating pairs disposed on opposing top and bottom wall sections of said cross bar, said cross bar being mountable on a conveyer, a plurality of separate prongs respectively removably mounted in the holes in the cross bar in sheet supporting position so that they may be readily replaced when bent or otherwise damaged while on the conveyer, each prong extending through the cross bar and snugly fitted within two of said oppositely located holes for maintaining the prong against displacement, and spring means carried by each of said prongs and engageable against an inner surface of said cross bar for holding the prongs in place in said cross bar.

9. A sheet supporting wicket for use with oven conveyers, comprising in combination a tubular cross bar having a plurality of holes therein at spaced intervals along its length and arranged in cooperating pairs disposed on opposing top and bottom wall sections of said cross bar, said cross bar being mountable on a conveyer, a plurality of separate prongs respectively removably mounted in the holes in the cross bar in sheet supporting position so that they may be readily replaced when bent or otherwise damaged while on the conveyer, each prong extending through the cross bar and closely engaging two of said oppositely located holes for maintaining the prong against displacement, a stop projection on each prong engageable with an outer surface of said cross bar for locating the prong in the cross bar, and spring means carried by each of said prongs and located adjacent the stop projection and engageable against an inner surface of said cross bar in cooperation with said stop projection for locking the prongs in place in said cross bar.

10. A sheet supporting wicket for use with oven conveyers, comprising in combination a sheet material tubular cross bar of rectangular cross section having spaced top and bottom and spaced front and rear wall sections, the top wall section at the ends of said cross bar being tapered outwardly and downwardly, said top and bottom wall sections having aligned slots for mounting the cross bar on a conveyer and having a plurality of aligned prong holes at the tapered ends and at spaced intervals along the cross bar between its tapered ends, said front wall section having a plurality of transverse outwardly projecting beads located adjacent the prong holes

for line contact with a sheet to be supported, and a plurality of sheet material prongs of reenforced U-shaped cross section removably mounted in the aligned holes in the cross bar and extending in fan shape from the cross bar with open spaces therebetween in sheet supporting position so that they may be individually replaced when bent or otherwise damaged while on the conveyer, each of said prongs having a longitudinal ridge aligning with and forming a continuation of the beads in said cross bar for completing the line contact with a sheet to be supported.

11. A cross bar for a sheet supporting wicket for use with oven conveyers, comprising a hollow tubular body having spaced top and bottom wall sections, said cross bar being mountable upon a said conveyer and extending transversely from side to side thereof, a plurality of holes aligned in pairs in said body wall sections and disposed at spaced intervals along its length, said pairs of holes being adapted for supporting individual prongs insertable therein, and means to mount said body on a conveyer.

12. A cross bar for a sheet supporting wicket for use with oven conveyers, comprising a sheet material tubular body of rectangular cross section having spaced top and bottom and spaced front and rear wall sections joined along one edge in an offset seam, the top wall section at the ends of said body being tapered outwardly and downwardly, said top and bottom wall sections having aligned prong holes at the tapered ends and at spaced intervals along the body between its tapered ends for supporting a plurality of individual prongs insertable therein in a fan arrangement with open spaces between the prongs, a plurality of transverse outwardly projecting beads in said front wall section for line contact with a sheet to be supported, and means to mount said body on a conveyer.

13. A sheet supporting prong for a wicket for use with oven conveyers, comprising a sheet material hollow body having a front wall section and two side wall sections, and an outwardly bent ridge extending longitudinally of said body in said front wall section for line contact with a sheet to be supported.

14. A sheet supporting prong for a wicket for use with oven conveyers, comprising a sheet material hollow body having a front wall section and two side wall sections, and an inwardly bent bead extending longitudinally of said body for a predetermined distance adjacent one end thereof for reenforcing said body for insertion into a wicket cross bar.

15. An elongated sheet supporting prong for a wicket for use with drying oven conveyers, comprising a sheet material hollow body having a front wall section and two side wall sections, one end of said body being insertable into a wicket cross bar, and a forwardly projecting longitudinal ridge on said front wall section for engaging in line contact a sheet to be dried in the oven, the inner end of said ridge constituting a stop projection on the front wall section for locating said prong in said cross bar.

16. A sheet supporting prong for a wicket for use with oven conveyers, comprising a sheet material hollow body having a front wall section and two side wall sections, said side wall sections being formed with a pair of oppositely disposed slots adjacent an end of the body for insertion into a wicket cross bar, and a hairpin spring having curved latch sections and connecting straight laterally extending locking sections disposed in said slots and projecting beyond the sides of said body for locking said body in a wicket cross bar.

17. A sheet supporting prong for a wicket for use with oven conveyers, comprising a long slender sheet material body of U-shaped cross section and tapering outwardly from its outer end to an inner end formed for insertion into a wicket cross bar, folded hems formed on the outer longitudinal edges of said body for reenforcing and rigidifying said body, and spring means carried in said body and projecting therebeyond for locking the body in place in a wicket cross bar.

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