Oct. 4, 1966 R. R. SEEDORF 3,276,569

SHEET HANDLING MECHANISM

Filed Aug. 17, 1964 2 Sheets-Sheet 1

Fig. 1.

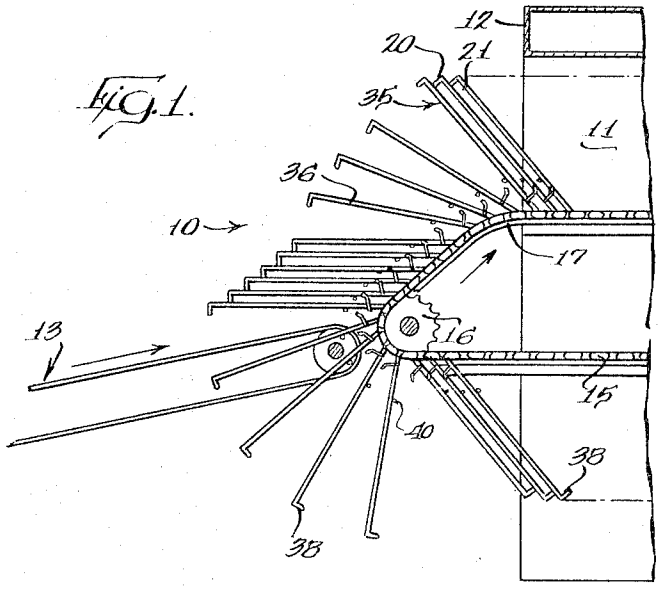
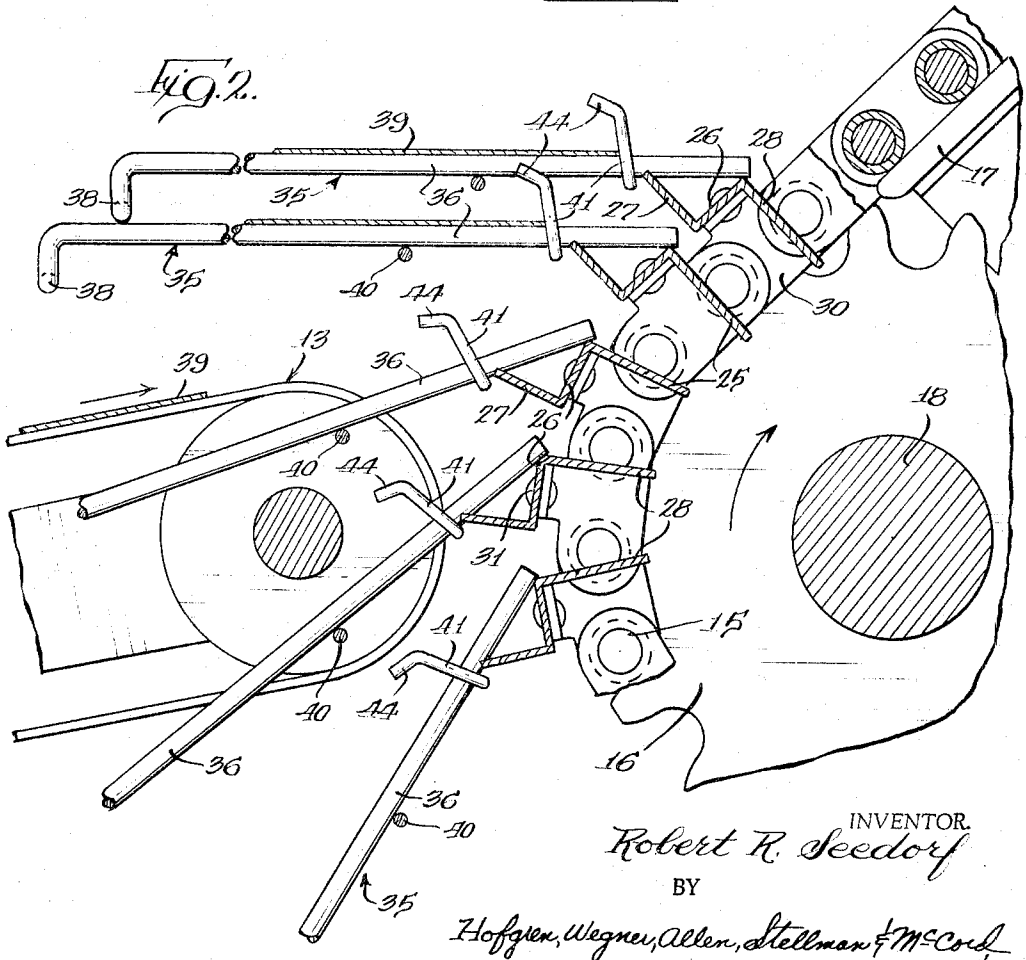


Fig. 2.



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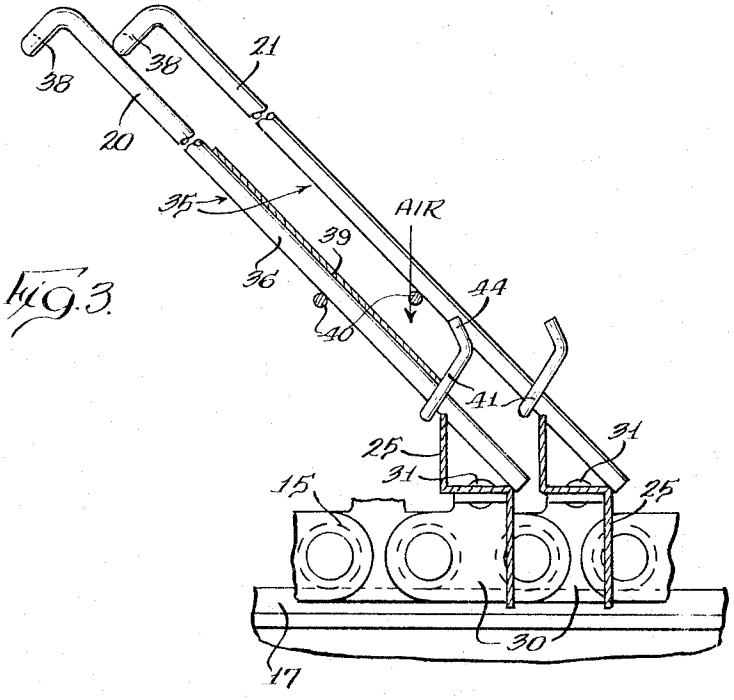
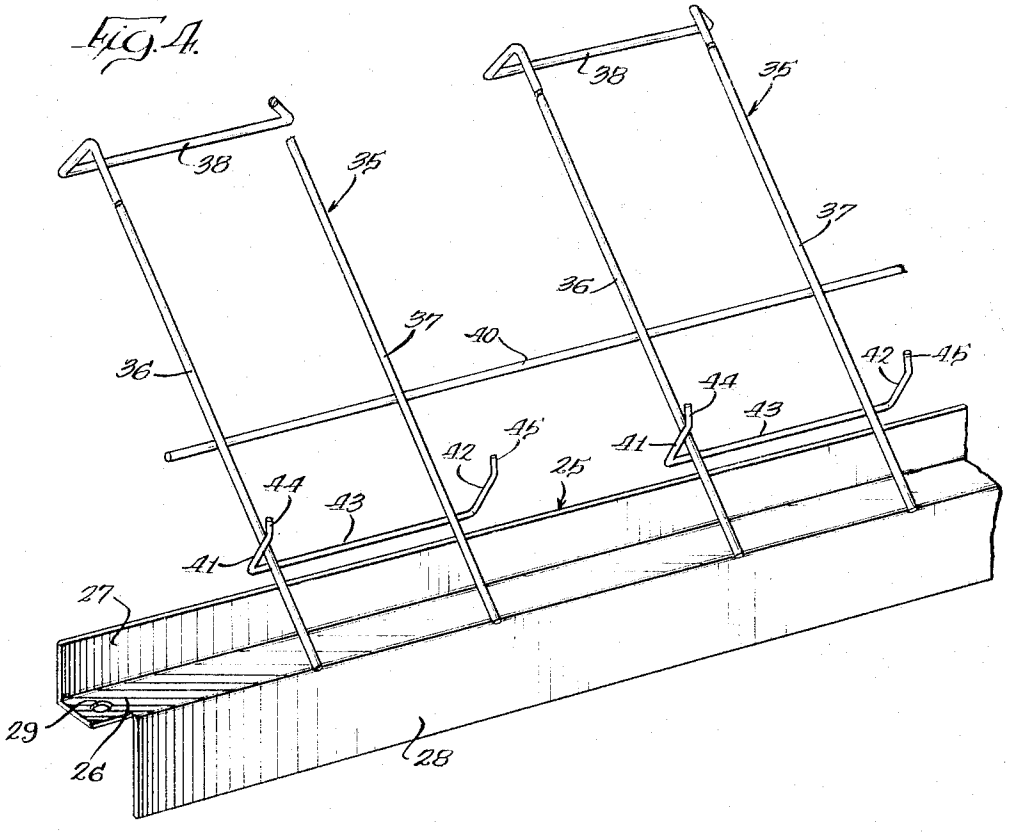


FIG. 3.

FIG. 4.



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SHEET HANDLING MECHANISM

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4 Claims. (Cl. 198—134)

This invention relates to sheet handling mechanism and more particularly to sheet holders in the form of wickets for conveying sheets through dryers and the like.

Dryers are commonly used for drying sheets subsequent to applying a coating or printing materials thereto and the sheets are conveyed through the dryer by conveying means including sheet holders, often referred to as "wickets." Wickets presently available are of costly construction and are not satisfactory in handling all types of sheets stock, particularly in permitting the formation of a wave pattern by inadequate holding of the sheet on the wicket.

An object of this invention is to provide new and improved sheet conveying mechanism and, particularly, a low-cost wicket construction for more positively holding sheets.

Another object of the invention is to provide a sheet holder assembly having a wicket normally defining an inclined plane for support of a sheet with means mounted on the wicket defining spaced points of support for the lower edge of the sheet while permitting flow of air over the sheet and said means defining with the wicket a corner for the lower edge of the sheet and urging the sheet edge into said corner.

Still another object of the invention is to provide a wicket assembly with a wicket mounted on a mounting base to define an inclined plane for holding a sheet and a pair of fingers mounted on the wicket above the base to define a pair of sheet edge supports and form a corner at the juncture of the wicket and fingers, with the fingers extending at an angle to said plane of less than 90° to guide a sheet edge into and hold the sheet edge in said corner.

Further objects and advantages will become apparent from the following detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is a fragmentary elevational view of a sheet drying apparatus with a sheet conveying mechanism shown in association therewith along with a feed-in conveyor for sheets;

FIG. 2 is a fragmentary elevational view on an enlarged scale of a part of the structure shown in FIG. 1;

FIG. 3 is a fragmentary vertical section showing the disposition of a pair of wickets as they enter the dryer as viewed in FIG. 1; and

FIG. 4 is a perspective view of a wicket assembly.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail an embodiment of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

The conveying of sheets is accomplished by a conveying mechanism indicated generally at **10** which passes through a chamber **11** of a dryer **12** to carry sheets from left to right, as viewed in FIG. 1. The dryer causes heated air to flow from top to bottom of the chamber and over the faces of sheets passing through the dryer.

Sheets are supplied to the conveying mechanism **10** by a suitable infeed conveyor mechanism, indicated generally at **13**, and at the right-hand end of the dryer the sheets are removed by mechanism, not shown. Alternatively, the sheets can be returned beneath the dryer by the conveying mechanism **10** for removal therefrom at a position adjacent the infeed conveyor **13**.

The conveying mechanism **10** embodies a pair of laterally spaced endless conveying elements in the form of chains, one of which is shown at **15**, which pass about pairs of sprockets at the opposite ends of the dryer with one of the sprockets **16** at the left-hand entry end of the dryer being shown in FIGS. 1 and 2. One pair of the sprockets is suitable driven to drive the chains along their path. A suitable surface **17** extends between the pairs of sprockets at the ends of the dryer to guide the chains and support the chain rollers in their path of travel. This surface could be flat and the sprocket chain rollers enlarged to ride on the surface **17**. A shaft **18** at the entry end mounts the sprockets **16** for rotation as driven by a suitable drive transmission.

The chains mount a plurality of sheet holders, one after the other, with the inclination of the sheet holders as they pass through the dryer being shown by holders **20** and **21** in FIGS. 1 and 3. The variation in relation of the sheet holders is clearly evident in FIG. 1 and is induced by the different curvatures of the chain as caused by the sprockets **16** and the supporting surface **17**. Thus the adjacent sheet holders are spaced relatively far apart at the level of the infeed conveyor **13**, so that a sheet can easily be fed onto the top of a sheet holder with the sheet holder being disposed in an inclined plane when the holders reach the position shown for holders **20** and **21** in FIG. 1.

More specifically, a sheet holder assembly embodies a mounting base **25** in the form of a channel having a length to span the distance between the conveying chains. The channel has a central section **26** with a continuous, upturned flange **27** at one edge and a continuous downturned flange **28** at the other edge. The central section **26** has openings at each end, one of which is shown at **29** for attachment to opposed links **30** of the chains, by means of rivets **31** or other suitable means. The downturned flange **28** can be omitted when its strength is not required for a lighter weight unit.

Each of the mounting bases mounts one or more wickets, indicated generally at **35**. The number of wickets mounted on a base and the height thereof are determined by the requirements of a sheet to be supported and the capacity of the dryer. As shown particularly in FIG. 4, each of the wickets is formed of rod stock shaped to provide a pair of spaced apart legs **36** and **37**, the lower ends of which are each secured to an edge of the upright flange **27** and the edge defined by the juncture of central section **26** and downturned flange **28** of the mounting base. This attachment can be obtained in any suitable manner, as by welding, and if desired the upper edge of the upturn flange **27** can be slightly notched to define recesses in which the legs **36** and **37** fit for providing a stronge weld. The upper ends of the legs **36** and **37** of a wicket are interconnected by a transverse section **38** which is longer than the width of the wicket for return carrying of a sheet, as more fully described hereinafter. As will be seen in FIG. 3, a wicket **35** has the legs **36** and **37** thereof defining an inclined plane on which a sheet **39** rests as it is conveyed through the dryer **12**. A brace rod **40** extends across and is secured to the wickets for strengthening thereof.

In order to provide support for a sheet **39**, each of the wickets is provided with a pair of fingers **41** and **42** which extend forwardly of the wicket legs **36** and **37**. These legs are formed integrally from a piece of rod stock and interconnected by the section **43** thereof with this

section being welded to the back sides of the wicket legs **36** and **37**.

The fingers **41** and **42** extend forwardly at an acute angle relative to the inclined plane defined by the wicket legs to define, at the juncture of the legs, corners for receiving the lower edges of the sheets with the acute angle tending to hold the sheet edge in the corner and guiding the sheet edge into the corner upon initial placement of a sheet on a wicket. The acute angle is less than 90° and, as shown herein, is 80°, although a substantial variation in angle can be provided, so long as an acute angle is utilized.

The spacing between the fingers **41** and **42** is greater than that between wicket legs **36** and **37**, so that ends **44** and **45** of the fingers **41** and **42**, respectively, may overlap the wicket legs of an adjacent wicket to close off the space between adjacent wickets. These ends **44** and **45** are upturned at an angle to the fingers to further assist in holding sheets on the wickets.

With the foregoing structure, which is simply formed and assembled, sheets are easily guided into position on the wickets and are maintained in relatively flat position, even though subjected to heated velocity air in the dryer **12**. The spaced-apart fingers **41** and **42** provide a relatively small amount of contact with the sheet edges and do not obstruct substantial air flow over the sheets **39**. This air flow helps to press the lower part of a sheet against the wicket legs **36** and **37**. With the angular disposition of the fingers relative to the wicket legs, any tendency of the sheet lower edge to curl during drying is resisted so that the sheet will not assume a wave pattern.

In the event it is desired to retain sheets on the wickets after passage through the dryer, the return lower run of wickets shown in FIG. 1 may be used to return the sheets to the left-hand end of the dryer, with the sheets being supported by the interconnecting sections **38** of the wickets, as well-known in the art.

In operation of the structure, the infeed conveyor **13** disposed between laterally adjacent wickets **35**, advances a sheet onto the wicket legs. As the wickets are moved to defined an inclined plane, as shown for wickets **20** and **21** in FIG. 1, the lower edge of a sheet is maintained in the plane of the sheet as by the angularly disposed fingers **41** and **42**. As seen in FIGS. 1 and 2, the upturned ends **44** and **45** of the fingers, also assist in capturing a sheet delivered by the infeed conveyor to prevent inadvertent movement of the sheet edge beyond the fingers.

I claim:

1. A sheet conveying mechanism comprising, a pair of spaced apart endless travelling members, a plurality of wicket assemblies mounted seriatim on said travelling members, each of said assemblies including a mounting base extended between said members with a space between adjacent bases for air flow therethrough, a wicket secured to said base with wickets on adjacent bases extending generally parallel to each other and at an angle to said travelling members, and a pair of spaced apart rod-like fingers mounted on a wicket independently of the mounting base and at a distance above said mounting base and extending toward the adjacent wicket in advance thereof to provide spaced points of support for the lower edge of a sheet supported by the wicket with minimal restriction to air flow and to hold the sheet lower edge at a distance from the space between adjacent mounting bases.

2. A sheet conveying mechanism as defined in claim **1** wherein the wicket has spaced legs and the fingers extend from the wicket legs at an angle of less than 90° and have upturned ends with the fingers being laterally positioned relative to the legs to overlap the legs of a preceding wicket.

3. A sheet conveying mechanism comprising, a pair of spaced apart endless travelling members, a plurality of wicket assemblies mounted seriatim on said travelling members, each of said assemblies including a mounting base extended between said members with a space between adjacent bases for air flow therethrough, the mounting base having a central section with an upturned flange along one edge of the central section and a downturned flange along the other edge, a wicket having a pair of legs secured to said base with the legs welded at two points to the upper edge of the upturned flange and said other edge to lie at an upwardly inclined angle to said travelling members and extend generally parallel to a wicket on an adjacent base, and a pair of spaced apart rod-like fingers fastened one to each of said wicket legs at a location above said upturned flange and extending toward the adjacent wicket in advance thereof to support the lower edge of a sheet.

4. A sheet conveying mechanism as defined in claim **3** wherein the fingers extend from the wicket at an angle of less than 90° and are laterally positioned relative to the legs to extend across and overlap the legs of a preceding wicket.

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