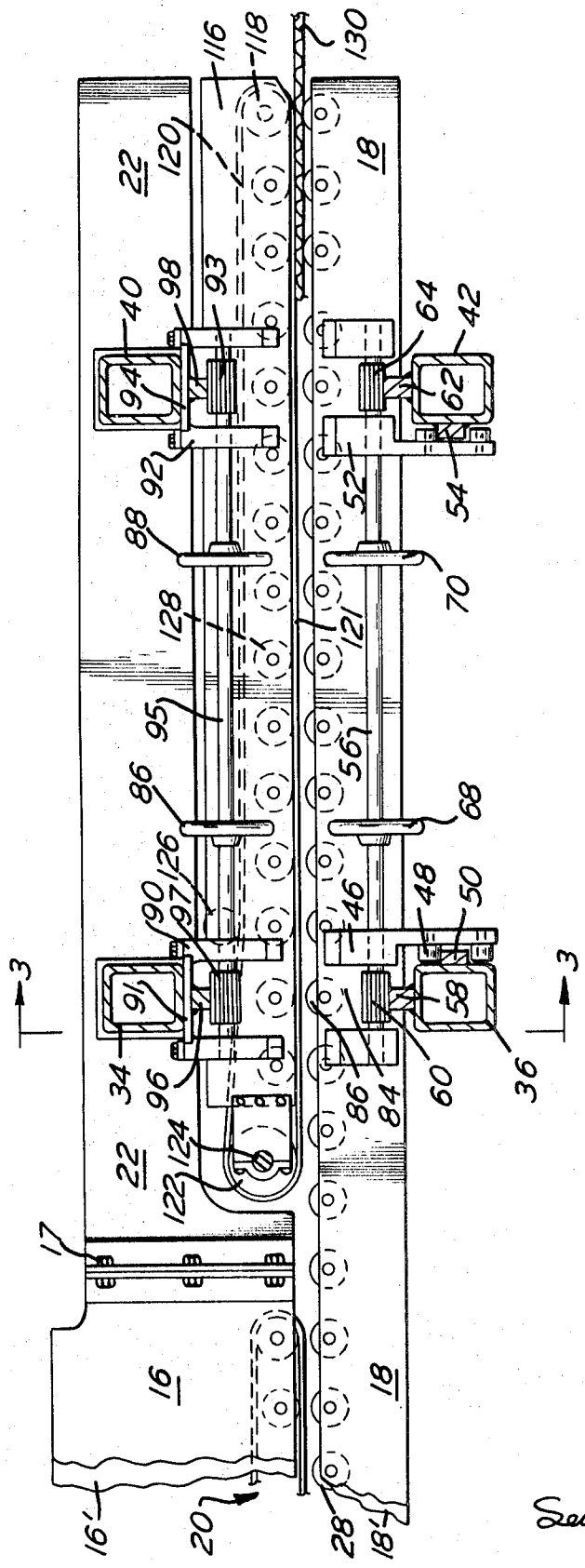
Nov. 16, 1971 H. E. KULWICKI 3,620,139

FOLDER-GLUER AND AUXILIARY CONVEYORS THEREFOR

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FIG. 2



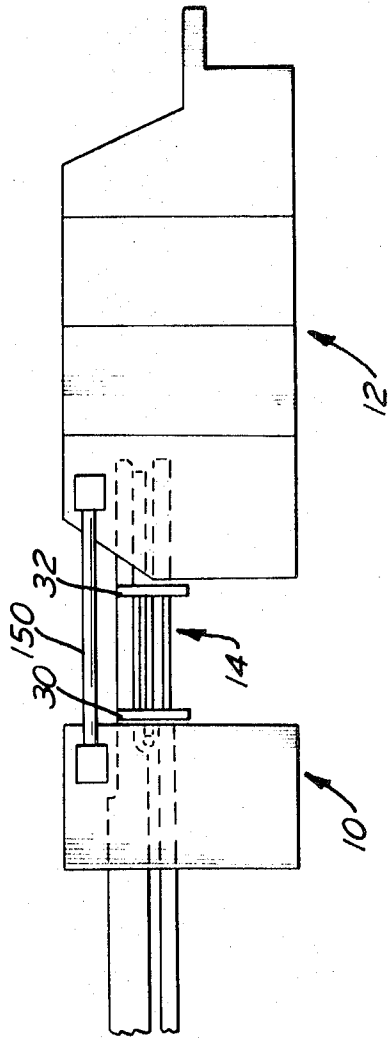


FIG. 1

INVENTOR
HENRY E. KULWICKI
BY
Seidel, Gonda & Goldhammer
ATTORNEYS.

Nov. 16, 1971 H. E. KULWICKI 3,620,139

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FIG. 3

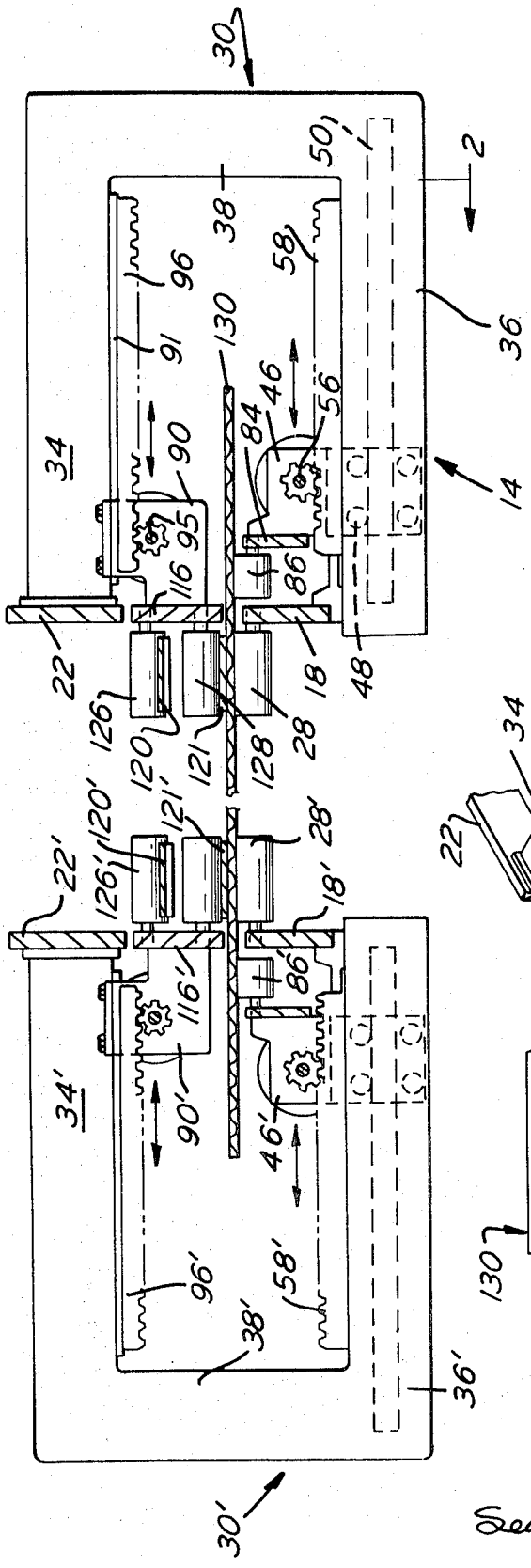


FIG. 4

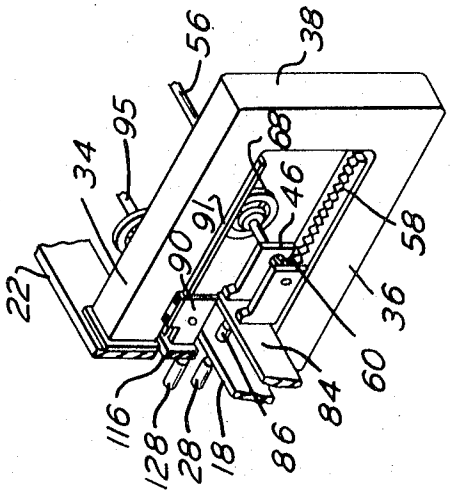
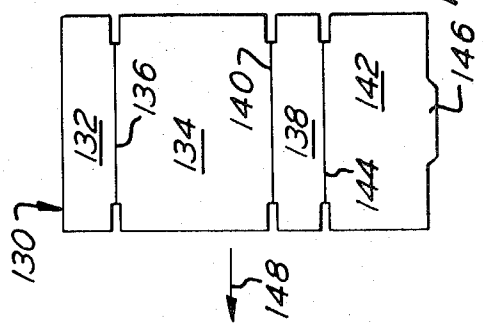


FIG. 5



INVENTOR
HENRY E. KULWICKI
BY
Seidel, Gonda, & Goldhammer
ATTORNEYS.

United States Patent Office

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FOLDER-GLUER AND AUXILIARY CONVEYORS THEREFOR

Henry E. Kulwicki, Willingboro, N.J., assignor to Harris-Intertype Corporation, Cleveland, Ohio

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U.S. Cl. 93—50 4 Claims

ABSTRACT OF THE DISCLOSURE

A machine for processing paperboard blanks such as a folder-gluer is provided with auxiliary feed conveyors at the inlet end of the machine. The auxiliary conveyors are movable toward and away from each other so that the area of contact between the auxiliary conveyors and the paperboard blanks may be varied.

This invention relates to a machine such as a folder-gluer having a main conveyor for causing paperboard blanks to move therealong. During such movement, the paperboard blanks may be slotted, scored, printed, die cut, folded and then may be glued, stitched, or taped. The machine is provided at its inlet end with a pair of auxiliary conveyors located between the folder-gluer and the discharge end of a printer-slotter or die cutter.

The auxiliary conveyors may be supported from the folding rails of the folder-gluer at the input end thereof. The auxiliary conveyors are movable toward and away from each other so that they may engage newly printed box blanks along the side panel portions thereof. The auxiliary conveyors include feed felts which may contact the box blanks in an area between the free edge of the box blank and the vertical plane containing the folding rails.

The adjustability of the auxiliary conveyors toward and away from each other provides for several advantages. One advantage relates to ink tracking. On box blanks where the ink is still damp or has not yet completely dried, the auxiliary conveyors may be disposed so as to avoid contact between the auxiliary conveyor belt and the ink which has not yet dried. This will provide extra drying time for the ink.

Another advantage of the auxiliary conveyors of the present invention relates to blank feed control. Some box blanks are so proportioned that they are fed in a more positive manner by a pair of conveyor belts that are capable of being positioned independently in a location which is not in line with the folding rails of the folder-gluer. As a result thereof, box blanks having a flap cut or a die cut can be transported without skewing.

A further advantage of the auxiliary conveyor is that it may be positioned out of the way of die cut scrap. If scrap enters the conveyors it may overlap the box blank, thereby interfering with subsequent operations and may cause down time of the machine to effect removal of the scrap.

It is an object of the present invention to provide a machine such as a folder-gluer having a novel auxiliary conveyor means at its inlet end for receiving and feeding box blanks from a printer-slotter or die cutter to the main conveyor of the folder-gluer.

It is another object of the present invention to provide

a novel auxiliary conveyor means attachable to the inlet end of a machine such as folder-gluer.

It is another object of the present invention to provide a folder-gluer having auxiliary conveyors at its inlet end which are adjustable toward and away from each other.

Other objects will appear hereinafter.

For the purpose of illustrating the invention, there is shown in the drawings a form which is presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

FIG. 1 is a diagrammatic side elevation view of the inlet end of the folder-gluer having auxiliary conveyors in operative position with respect to a printer-slotter.

FIG. 2 is a longitudinal sectional view through the auxiliary conveyor means at the inlet end of the folder-gluer.

FIG. 3 is a sectional view taken along the line 3—3 in FIG. 2.

FIG. 4 is a perspective view of one C-shaped frame associated with the auxiliary conveyor means.

FIG. 5 is a plan view of a typical box blank.

Referring to the drawings in detail, wherein like numerals indicate like elements, there is shown in FIG. 1 the inlet end of a folder-gluer having an auxiliary conveyor means **14** thereon in operative juxtaposition to a diagrammatic illustration of a printer-slotter **12**. The auxiliary conveyor means **14** is adapted to feed box blanks from the printer-slotter **12** to the main conveyor **20** on the folder-gluer **10**.

The folder-gluer **10** is provided with adjustable top side rails **16** and **16'** and adjustable bottom folding rails **18** and **18'**. The main conveyor **20** on the folder-gluer **10** is supported by the top rails **16** and **16'**. Idler rollers **28** are supported by the bottom folding rails **18** and **18'** at spaced points therealong.

The auxiliary conveyor means **14** includes a top extension rail **22** removably connected to the top rail **16** by bolts **17** and a top extension rail **22'** similarly connected to the rail **16'**. The auxiliary conveyor means **14** includes a pair of units adapted to engage opposite edge portions of the box blank. One of the units is supported by the rails **22** and **18**. The other of the units is supported by the rails **22'** and **18'**. Since the units are identical, only the unit supported by rails **22** and **18** will be described in detail with corresponding prime numerals being provided with respect to corresponding structure on the other unit.

Rail **18** is provided with idler rollers **28** at spaced points therealong. The idler rollers **28** are in line with and are at the same elevation as the idler rollers **86** to be described hereinafter. The rails **22** and **18** support first and second C-frames designated as **30** and **32**. Frame **30** is adjacent the folder-gluer **10** while frame **32** is juxtaposed to the printer-slotter **12**. Each of the C-frames **30** and **32** is identical, except for location of minor structures for left and right-handedness.

Frame **30** is provided with a top leg **34**, a parallel bottom leg **36**, and a vertical leg **38** connected to the legs **34** and **36**. Frame **32** includes a top leg **40** and a bottom leg **42** connected by a vertical leg corresponding to leg **38**.

As shown more clearly in FIG. 2, a carriage **46** is provided with rollers **48** in rolling contact with a track **50** on a side of the bottom leg **36** for movement therealong. A similar carriage **52** is rollingly supported by track **54** on a side of the bottom leg **42**. The carriages **46** and **52** are in-

terconnected by a horizontal shaft **56**. Shaft **56** has a pinion **60** meshed with rack **58**.

The rack **58** is fixedly secured to the upper surface of leg **36**. At the other end of shaft **56**, there is provided a pinion **64** which meshes with rack **62**. Rack **62** is fixedly secured to the upper surface of leg **42**. Also on shaft **56** there is provided a motor means such as two handwheels **68** and **70** which may be utilized to cause shaft **56** to rotate thereby propelling the carriages **46** and **52** by means of the rack and pinion associated with each carriage.

The carriages **46** and **52** may also be propelled by an impulse motor to cause the shaft **56** to rotate through a predetermined number of revolutions and thereby reciprocate the carriages **46** and **52** any predetermined distance toward and away from the rail **18**.

The carriages **46** and the carriage **52** jointly support a plate **84**. A series of idler rollers **86** is supported by plate **84**. See FIGS. 2–4. The idler rollers **86** are adapted to engage the lower surface of the box blank to assist in maintaining the side panel portions of the box blank horizontal and in the same plane as the remainder of the blank.

The top leg **34** of the C-frame **30** is provided with a track **91** on its lower surface which supports a carriage **90** for movement therealong. The top leg **40** of C-frame **32** is provided with a comparable track **94** which supports a carriage **92** for movement therealong. Track **91** on its lower surface is provided with a rack **96** meshing with a pinion **97** on one end of shaft **95**. Track **94** is provided with a rack **98** on its lower surface meshing with pinion **93** at the other end of shaft **95**. Two handwheels **86** and **88** are provided on shaft **95** which may be utilized to cause shaft **95** to rotate thereby propelling carriage **90** and carriage **92** by means of the racks and pinions.

The carriages **90** and **92** reciprocate in unison along the top legs **34** and **40**, toward and away from the rail **22**. The carriages **90** and **92** are connected to a plate **116**. As shown more clearly in FIG. 2, an idler roller **118** is supported at the righthand end of plate **116**. An auxiliary conveyor belt having a top run **120** and a bottom run **121** extends around the idler roller **118**. The conveyor belt also extends around a pulley **122** supported from the lefthand end of plate **116** in FIG. 2.

The pulley **122** is keyed to a shaft **124** so as to be driven by said shaft while permitting the pulley to reciprocate along the shaft. Shaft **124** extends across the full width of the auxiliary conveyor means **14** and therebeyond so as to constitute a shaft for driving the auxiliary conveyor belt. The auxiliary conveyor belt on the unit on the lefthand end of FIG. 3 is likewise driven by shaft **124** (but not shown) in the same manner as described above.

A tension roller **126** engages the upper surface of the top run **120** of the auxiliary conveyor belt. Roller **126** is rotatably supported by the plate **116**. A plurality of idler rollers **128** are rotatably supported by the plate **116** between the runs **120** and **121** of the conveyor belt and engaging the lower run **121**. As the carriages **90** and **92** move toward and away from the vertical plane of rail **22**, the plate **116** causes the runs of the conveyor belt as well as the rollers **126** and **128** to move therewith.

In FIG. 5, there is illustrated a box blank designated generally as **130**. The box blank **130** illustrates a typical box blank which may be more advantageously fed to the folder-gluer **10** by the auxiliary conveyor means **14**. Box blank **130** includes a panel **132** connected to a panel **134** by means of a score-line **136**. Panel **134** is connected to panel **138** by means of a score-line **140**. Panel **138** is connected to panel **142** by means of a score-line **144**. The free edge of panel **142** is provided with a tab **146**.

The operation of the auxiliary conveyor means **14** is as follows:

Box blanks **130** will be printed and slotted by the printer-slotter **12** in a conventional manner. The box blanks **130** are received by the auxiliary conveyor means **14** while moving in the direction of arrow **148** in FIG. 5. The score-line **144** will be aligned with the rails **18** and **116**. The score-line **136** will be aligned with the rails **18'** and **116'**.

The handwheels **68** and **70** may be actuated (independently) to position the rollers **86** in any desired location between the far side of score-line **144** and the free edge of panel **142** while engaging the bottom surface of the blank **130**. The rollers **86'** on the unit at the lefthand end of FIG. 3 will likewise be positioned to the most desirable area for contact with the lower surface of panel **132**. The relative positions of the bottom idler rollers on the respective units will be different due to the difference in size of the panels **132** and **142**.

The other handwheels **86** and **88** may be activated independently to cause the carriages **90** and **92** to reciprocate along their tracks so as to preposition the bottom run **121** at any location on panel **142** between the far side of the score-line **144** and the free edge of panel **142**. When the bottom run **121** engages the panel **142** adjacent the free edge thereof, the idler roller **86** should be generally in the same vertical plane as the belt so as to provide support for the panel **142** to prevent the panel from being deflected out of the plane of the box blank **130**. The unit at the lefthand end of FIG. 3 may likewise be adjusted so that the bottom run **121'** engages the panel **132** at the desired location between the inside of the score-line **136** and the free edge of panel **132**.

The selective positioning of the auxiliary conveyor belts may be adjusted prior to each run of a different type box blank so as to be in the most desirable area depending upon the slots, die cut-outs, score-lines, and printed areas. By avoiding the printed areas on the box blank, the smearing of such printed areas, which have not yet dried, by the auxiliary conveyor belts is avoided.

The folder-gluer may be driven separately but synchronized with the driving of the printer-slotter **12**. If desired, a drive take-off shaft **150** may extend between the printer-slotter **12** and the folder-gluer **10** so that the drive for the printer-slotter **12** may be selectively connected to the drive shaft for the folder-gluer **10** and for driving shaft **124**.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof.

It is claimed:

1. Apparatus comprising a folder-gluer having adjustable side rails and a main conveyor, a pair of auxiliary conveyors at the input end of said main conveyor for feeding blanks to the main conveyor, said auxiliary conveyors being connected to said side rails for movement with the side rails as the latter are adjusted, said auxiliary conveyors including endless belts which are adjustable horizontally toward and away from each other, and means for adjusting said belts toward and away from each other generally perpendicular to the direction of feeding the box blanks and generally perpendicular to the side edges of the belts.

2. Apparatus in accordance with claim **1** wherein said belts are each supported by a carriage from a separate horizontal support arm, each of said arms being supported by one of said side rails.

3. Apparatus in accordance with claim **2** including a motor means connected to each carriage for reciprocating the carriage along its support arm toward and away from a vertical plane containing the side rails, said machine being a folder-gluer.

4. Apparatus in accordance with claim **1** wherein said auxiliary conveyors include a first set of top and bottom rails, a second set of top and bottom rails spaced from and parallel to said first set, first and second C-shaped frames connected to the rails of each set, a carriage on each frame mounted for movement toward and away from the vertical plane of the rails, means connecting the carriages associated with the first set of rails for movement in unison as a set of carriages, means connecting the carriages associated with the second set of rails for movement in unison

as a set of carriages, and each endless conveyor belt being supported by one set of carriages, each endless conveyor belt extending around rollers mounted for rotary movement about axes parallel to the direction of movement of the carriages.

References Cited

UNITED STATES PATENTS

654,136	7/1900	Cowles	93—46
1,856,498	5/1932	Miller	198—19
2,551,080	5/1951	Allen	198—19
3,204,756	9/1965	Lesch	198—19 X

OTHER REFERENCES

International Paper Box Machine Co., publication concerning their "Model A Folding and Gluing Machine" (only pages 3–17 are relied on), copy in 93—50. (This pamphlet would have been published in the early 1920's, per Walter Stopyra, ass't to the sales manager, per telephone conversation on Sept. 8, 1970.)

WAYNE A. MORSE, Primary Examiner

U.S. Cl. X.R.

93—46, 52; 198—19