July 26, 1966 W. E. ASCHENBRENNER 3,262,699

SHEET CONTROL DEVICE

Filed Aug. 13, 1964 2 Sheets-Sheet 1

Fig. 1.

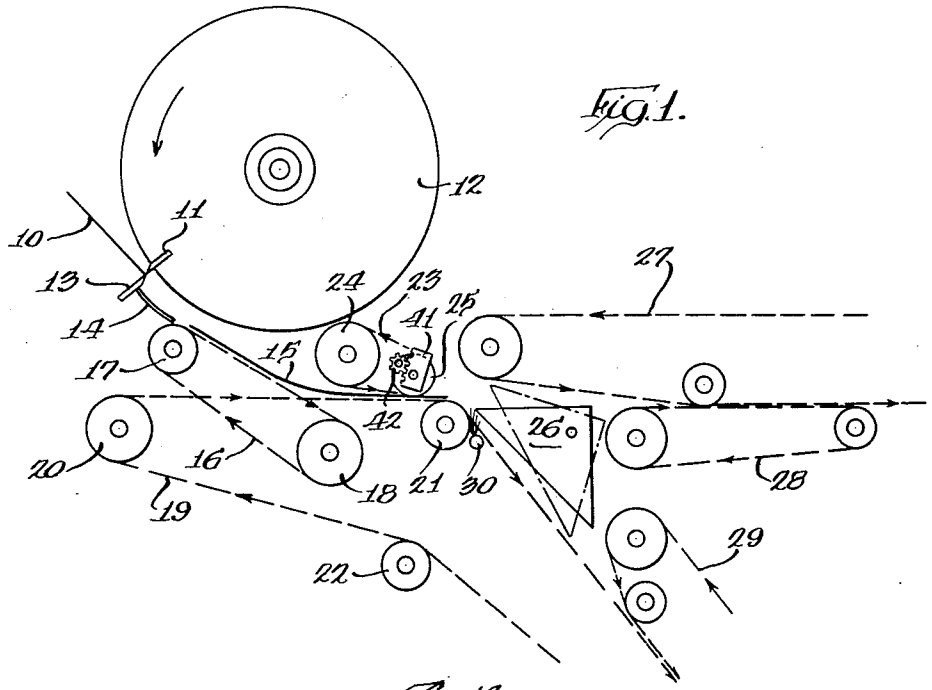
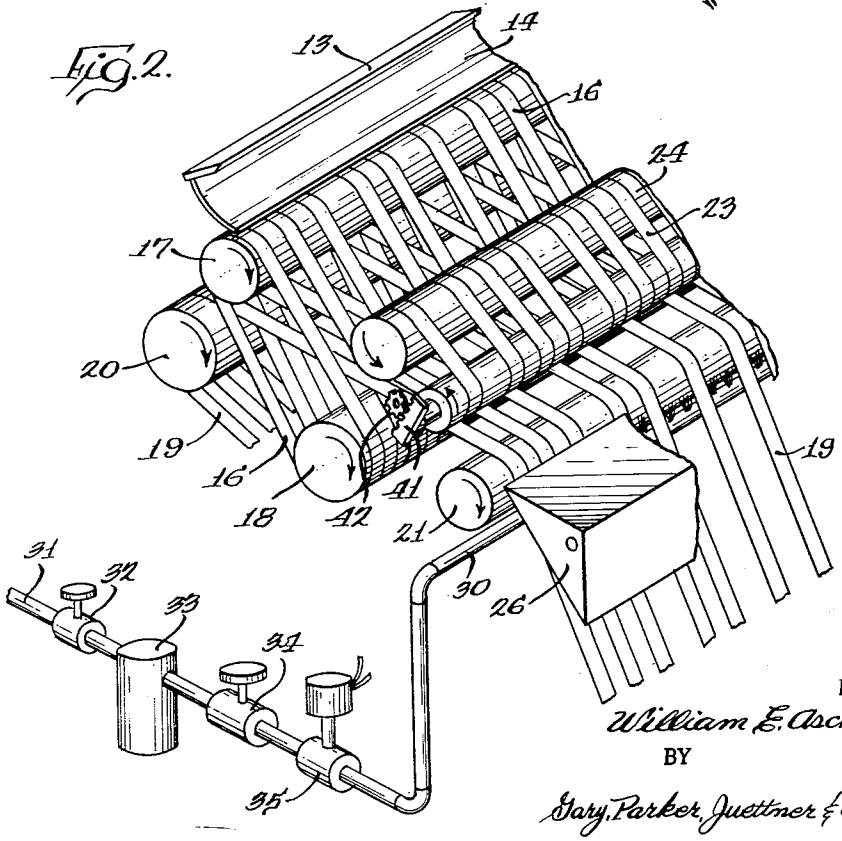


Fig. 2.



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Fig. 3.

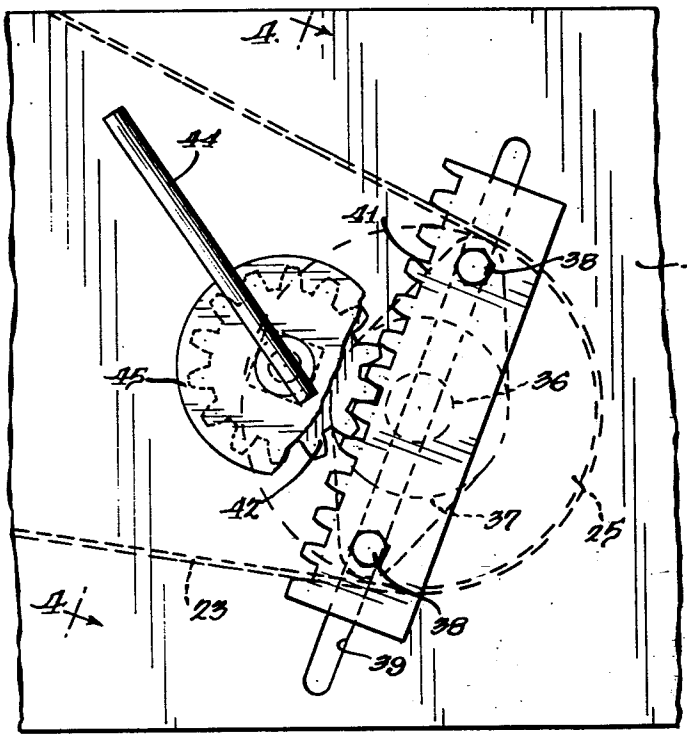
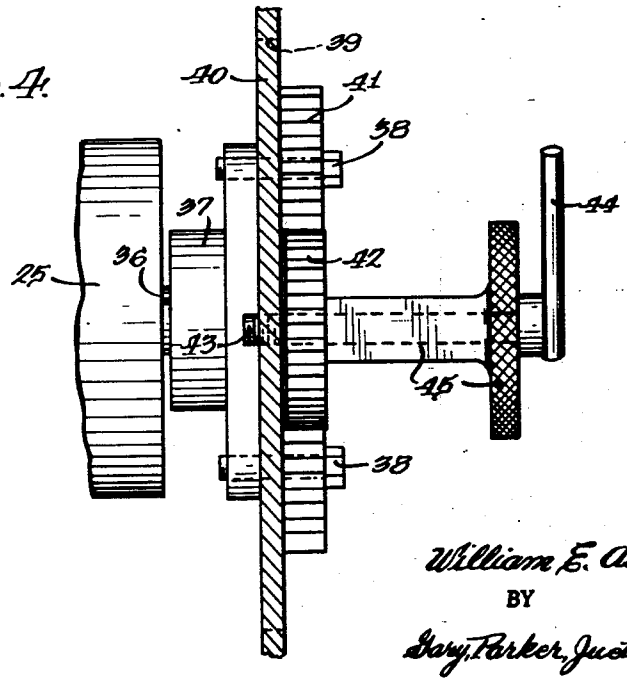


Fig. 4.



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SHEET CONTROL DEVICE

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8 Claims. (Cl. 271—45)

The present invention relates to means for facilitating the forward movement of individual sheets cut from a continuous web.

The invention is particularly concerned with improvements in apparatus for cutting continuous webs of paper into sheets and moving them forwardly in a smooth continuous manner at high speeds, and wherein sheets are intermittently, by sampling means, caused to be diverted from the main path of movement to a secondary path.

In one specific embodiment the present invention relates to means for adjustably controlling the frictional engagement or pressure between opposed conveyor surfaces which initially receive and move forwardly a newly severed individual sheet, with the object of preventing the sheet from being drawn away from the cutting knife too quickly and to prevent whipping, which might crumple the trailing edges of the sheets, cause them to curl, or jam up, and otherwise prevent smooth continuous operation.

In another specific embodiment the present invention relates to means, correlated to the aforesaid sampling means, for preventing tendency of the forwardly moving sheets to inadvertently move into the sampling path, particularly when the sheets are somewhat curled due to having been cut from near the end of the supply roll, with the object of thereby facilitating smooth sheet passage in the desired direction and permitting the cutting operation to be conducted at high uniform speed.

The foregoing objects and advantages, details of construction and arrangement of parts and the economies thereof will be apparent from a consideration of the following specification and accompanying drawings wherein:

FIG. 1 is a diagrammatic side elevational view of the apparatus of the present invention.

FIG. 2 is a perspective view of a portion of the apparatus shown in FIG. 1, with added details.

FIG. 3 is a relatively enlarged fragmentary detail view of adjustment means for one of the rolls shown in FIGS. 1 and 2, and

FIG. 4 is a section on the line 4—4 of FIG. 3.

Referring to the drawings, the reference numeral **10** indicates a forwardly moving paper web, drawn and moved forwardly from a supply roll by conventional means, not shown. In its forward passage, the web **10** is intermittently cut into sheets of predetermined length by means of the radial fly knife component **11** on the driven roll **12** meeting the fixed or bed-knife component **13** on the holder **14**.

The resulting severed sheet **15** is then deposited on and moved forwardly by the spaced series of conveyor belts or tapes **16** embracing rolls **17** and **18**, one of which is driven. The sheet **15** is thus carried forward by the spaced conveyor tapes **19** which are intermeshed with tapes **16**, the tapes **19** being driven in the direction as shown by the arrows and passing in part around rolls **20**, **21** and **22**.

Disposed in juxtaposition to the upper run of tapes **19** is a separate series of tapes **23** caused to move about the rolls **24** and **25** the direction indicated, one of said rolls being driven. The tapes **23** and **19** between them frictionally grip the sheet **15** and move it forwardly at a speed generally greater than the speed of the web **10**, and then pass the sheets over the sample gate **26** and between the conveyors **27** and **28**.

Intermittently, and as more fully described and claimed in the co-pending application of William J. Haselow, Serial No. 89,383, filed February 15, 1961, now Patent Number 3,180,190, the sampling gate **26** is caused to move to the dotted position shown in FIG. 1, whereupon a sheet **15** is deflected downwardly onto tapes **19** and to and between the tapes **19** and conveyor belt or tapes **29**.

Although the sheets **15** normally pass above the gate **26** when it is tilted downwardly as shown in the full line position of FIG. 1, when the sheets become curled for some reason, and particularly when they are severed from near the end of the supply roll, there is a tendency for the sheets to follow down and around roll **27** and under the adjacent edge of gate **26**. In order to prevent this, I provide air pressure by means of the pipe **30** disposed parallel to roll **27** having longitudinally spaced vents adapted to blow air in the narrow space between roll **27** and the adjacent edge of gate **26**, against the underside of a passing sheet **15**. This tends to prevent accidental and unwanted downward movement of sheets **15** and permits increase in the speed of operation of approximately 100 feet per minute, particularly due to the fact that the cutter does not have to be slowed up near the supply roll end.

Air is supplied by the air source line **31** controlled by shut-off valve **32**, and through filter **33**, pressure control valve **34**, and electric solenoid valve **35** to air distribution pipe **30**. The electric solenoid valve **35** is so connected that when the gate **26** is opened, (i.e., tilted upwardly to the dotted line position) the air supply is automatically shut off, and when the gate **26** is closed or tilted downwardly the air automatically returns to the same pressure as before, which can be about eighty pounds per square inch.

Control of frictional engagement of a cut sheet **15** as it passes between belts **19** and **23** can be accomplished by adjusting the spacing of roll **25** and its carrier straps **23** in relationship to the straps **19**. For this purpose the shaft **36** of roll **25** is journalled in flanged bearing **37** which is releasably secured by means of bolts **38**, extending through the slot **39** in the frame wall **40**, to the sliding rack **41**. Upon loosening of bolts **38**, and the tightening screw **43** by means of lever **44**, the rack **41** can be moved parallel to slot **39** and the spacing of roll **25** and its straps **23** adjusted as to distance from or pressure against belts **19**. For ease of such adjustment a pinion **42** meshes with rack **41**. The pinion **42** is pivotally carried by the frame wall **40** by means of the screw **43**, and is provided with a handle or lever **44**. Adjustment is made by manipulating the knurled flange **45** manually or the angular elongated shank **45** by means of a wrench. Although adjustment means have been shown on one side of roll **25** it will be understood that similar adjustment means are provided on the opposed side.

In this manner adjustment can be made as to the nip between roll **25** and its tapes with the tapes **19** to provide for different conditions of operation, speeds, sheet thickness. Raising of the roll **25** permits the sheet **15** to retain a natural position as distinguished from possible "whipping" as might be the case if pressure is too great when the roll **25** is too low and the sheet **15** pulled away from the knives **11** and **13** too quickly.

It will be noted from FIG. 3 that the slot **39** is inclined to the vertical as shown. However, the slot **39** is disposed normal to a plane passing through the axes of rolls **24** and **25**. By reason of this the tension on the embracing tapes **23** remains substantially constant upon upward or downward adjustment of roll **25** in the manner aforesaid.

Although I have shown and described the preferred embodiment of my invention it will be understood by those skilled in the art that changes may be made in the details thereof without departing from its scope as comprehended by the following claims.

I claim:

1. Apparatus for conveying sheets of material from a rotary cutter comprising a first endless belt conveyor disposed about a plurality of rollers, a second juxtaposed endless belt conveyor disposed about a pair of rollers and means for moving one of said pair of rollers in a direction normal to a plane passing through the axes of said pair of rollers for adjustably controlling the proximity of said conveyor belts.

2. Apparatus for conveying sheets of material from a rotary cutter comprising a first endless belt conveyor disposed about a plurality of rollers, a second juxtaposed endless belt conveyor disposed about a pair of rollers and inclined to said first conveyor and forming a nip therewith, and means for moving one of said pair of rollers in a direction normal to a plane passing through the axes of said pair of rollers for adjustably controlling the bite of said nip whereby a newly severed individual sheet drawn away from the cutter is prevented from being drawn away too quickly and to prevent whipping thereof.

3. Apparatus for conveying sheets of material from a rotary cutter comprising a first endless belt conveyor disposed about a plurality of rollers, a second juxtaposed endless belt conveyor disposed about a pair of rollers and inclined to said first conveyor and forming a nip therewith, and means for adjusting the bite of said nip comprising means engaged with one of the rollers carrying said second conveyor for adjusting the proximity of said second conveyor in a direction normal to a plane passing through the axes of said pair of rollers, as it passes about said one roller, with respect to said first conveyor belt.

4. Apparatus for conveying sheets of material from a rotary cutter comprising a first endless belt conveyor disposed about a plurality of rollers, a second endless belt disposed about a pair of rollers and above said first belt and inclined thereto in a forwardly direction, and means for adjusting the degree of inclination of said second belt to the first belt comprising rack and pinion means for moving the one of said pair of rollers closest to said first conveyor in a direction normal to a plane passing through the axes of said pair of rollers.

5. Apparatus for conveying sheets of material from a rotary cutter comprising a first endless belt conveyor disposed about a plurality of rollers, a second endless belt disposed about a pair of rollers and above said first belt and inclined thereto in a forwardly direction, and means for adjusting the degree of inclination of said second belt to the first belt comprising means for moving the one of said pair of rollers closest to said first conveyor in a direction normal to a plane passing through the axes of said pair of rollers.

6. Apparatus for conveying sheets of material from a rotary cutter comprising a first endless belt conveyor composed of a plurality of spaced straps disposed about a plurality of rollers and changing direction about one of said rollers from a substantially horizontal to a substantially downward inclined direction, means for preventing a sheet disposed on the horizontal portion of said conveyor from following its downward inclination, a second conveyor belt disposed about a pair of rollers and above and inclined to the horizontal portion of said first conveyor and forming a nip therewith, and means for adjusting the bite of said nip and means for adjusting the degree of inclination of said second belt to the first belt comprising means for moving the one of said pair of rollers closest to said first conveyor in a direction normal to a plane passing through the axes of said pair of rollers.

7. The apparatus of claim 5 further comprising means for preventing a sheet disposed on the horizontal portion of said first conveyor from following its downward inclination.

8. The apparatus of claim 5 further including means for preventing a sheet disposed on the horizontal portion of said conveyor from following its downward inclination comprising air jet means disposed inwardly of said conveyor and adjacent to said direction-changing roller for directing jets of air against the under surface of said sheet.

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