Feb. 4, 1969 F. LEMBO 3,425,608

WEB GUIDING ROLLER AND SUPPORT

Filed May 17, 1967

Sheet 1 of 2

Fig. 1

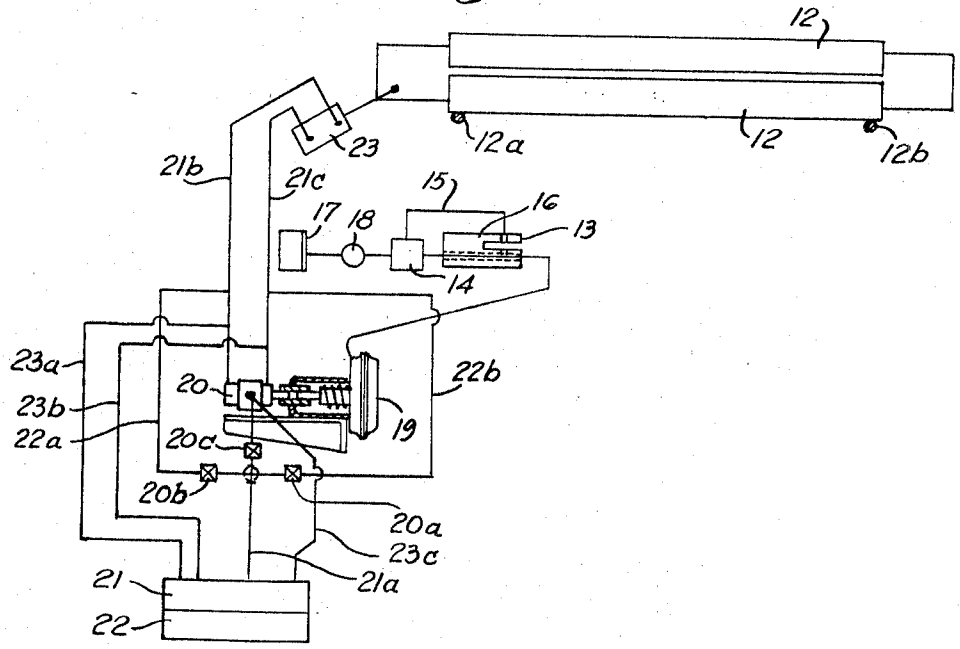
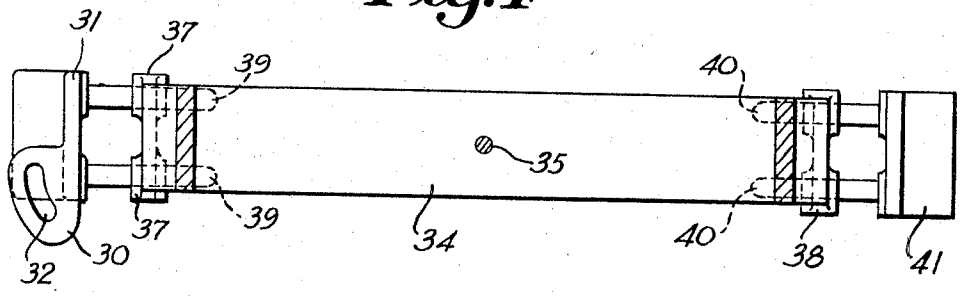


Fig. 4



INVENTOR.
FRANK LEMBO
BY Richards & Geier
ATTORNEYS

Feb. 4, 1969 F. LEMBO 3,425,608

WEB GUIDING ROLLER AND SUPPORT

Filed May 17, 1967

Sheet 2 of 3

Fig. 2

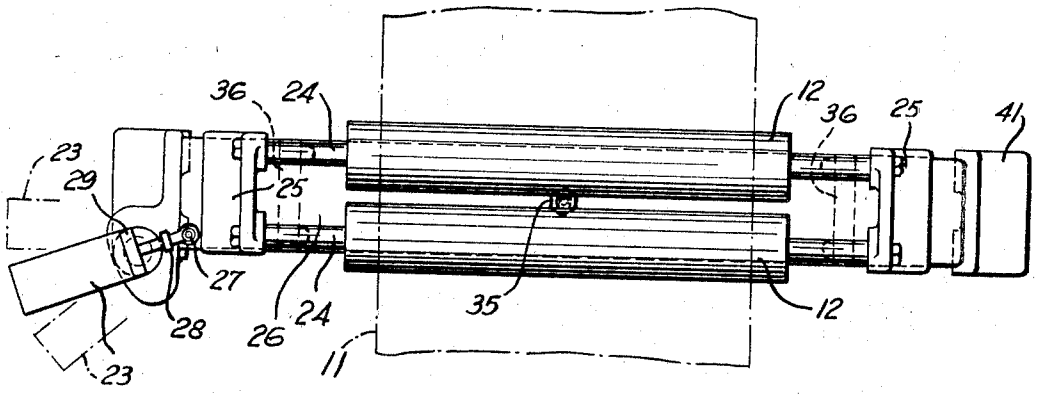
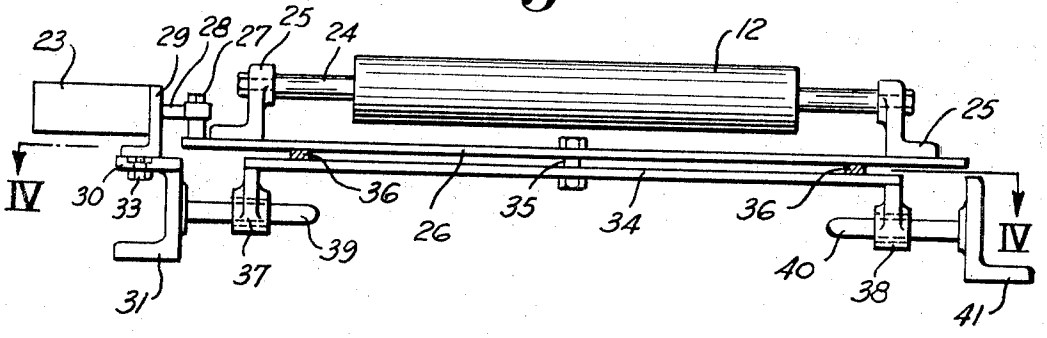


Fig. 3



INVENTOR.
FRANK LEMBO
BY Richards & Geier
ATTORNEYS

United States Patent Office 3,425,608
Patented Feb. 4, 1969

3,425,608

WEB GUIDING ROLLER AND SUPPORT

Frank Lembo, 235 McLean Blvd.,
Paterson, N.J. 07504

Filed May 17, 1967, Ser. No. 639,184
U.S. Cl. 226—19 7 Claims
Int. Cl. B65h 25/26

ABSTRACT OF THE DISCLOSURE

Rollers guiding a web on its way to a processing equipment are subjected to a manually adjustable swivelling movement and simultaneously to a movement transverse to the direction of the web. The swivelling movement is effected by an upper plate carrying the rollers while the transverse movement is carried out jointly by the upper plate and by a suitably guided lower plate. The movements are produced by a hydraulic cylinder which is actuated by an error signal produced by a finger sensing the web by air pressure.

This invention relates to a web guide and refers more particularly to an automatic web guiding and aligning equipment.

Automatic web guides known in prior art operate with detectors sensing the edges of a moving web by air pressure supplied by a source of compressed air. Error signals are transmitted to valves to motor operated hydraulic work cylinders which adjust rollers guiding the web.

An object of the present invention is to improve web guides of this type by providing means which will easily and effectively actuate the web guiding rollers so as to swivel and traverse them for the purpose of aligning webs into a processing equipment.

Other objects of the present invention will become apparent in the course of the following specification.

In the accomplishment of the objectives of the present invention it was found desirable to mount the web guiding rollers upon a support which can swing about a centrally located pivot and which at the same time is movable in a direction transverse to the direction of movement of the web. The support is actuated by a hydraulic work cylinder which can be moved manually to the required angle. Thus the cylinder while moving the roller in the transverse direction will also swivel the support to the extent of a preset angle. This adjustment can be easily and quickly effected and can vary from 1° to 45°.

The work cylinder is actuated in a manner known in prior art by the use of a sensing finger supplying a flow of air to an edge of the web from a mechanized air guide and valve. An air diaphragm is connected to the air valve and is also connected by means of a four-way valve to a storage tank and pump and to the above described work cylinder.

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawings, showing by way of example, a preferred embodiment of the inventive idea.

In the drawings:

FIGURE 1 is a diagram illustrating the connections of the web guide assembly.

FIGURE 2 is a top view of a set of guide rollers and parts connected therewith.

FIGURE 3 is a side view of the rollers shown in FIG. 2, partly in section.

FIGURE 4 is a section along the line VI—VI of FIG. 5.

The drawings show a web **11** which is moved over guide rollers **12** in the direction of the arrow **42** into

a processing equipment (not shown). Obviously, any suitable number of guide rollers may be used.

The automatic web guide includes sensing fingers **13**, the number of which can be varied at will. A sensing finger **13** is connected to an air valve assembly **14** constituting a mechanized air guide. An air transmitting tube **15** is connected to the air valve assembly **14** and to an air nozzle **16** which directs a flow of air to the sensing finger **13**. The air transmitting tube **15** is connected to a source **17** of compressed air supply and includes a regulator **18**. The air valve assembly **14** is connected to an air diaphragm **19** which is connected with a four-way valve **20**. A hydraulic pump **21** transmits pressure fluid from a storage tank **22** through a conduit **21***a* and through the four-way valve **20** to conduits **21***b* and **21***c* leading to a work cylinder **23** which is connected to the assembly of guide rollers **12**. The valve **20** is operated by solenoids **20***a*, **20***b* and **20***c*. The solenoid **20***c* is located in the conduit **21***a* while solenoids **20***a* and **20***b* are located in conduits **22***a* and **22***b* connecting the conduit **21***a* with the conduits **21***b* and **21***c*, respectively. Switches **12***a* and **12***b* are connected with the guide roller assembly **12** and are used to operate the solenoids **20***a* and **20***b*. Conduits **23***a*, **23***b* and **23***c* constitute bleed or return lines to the tank **21**.

In operation an edge of the web **11** passes through the sensing finger **13** and is subjected to air pressure by the air nozzle **16**. An error signal is transmitted by the air valve assembly **14** to the air diaphragm **19** which, by means of the four-way valve **20**, will drive the pump **21** operating the work cylinder **23**.

The guide rollers **12** and the manner of operating them constituting the subject matter of the present invention, are illustrated in FIGS. 2–4. Two guide rollers **12** are mounted on shafts **24** which are carried upon opposed angular frames **25**. The frames **25** are mounted upon a flat supporting plate **26**. A vertical pivot stud **27** is fixed to the plate **26** close to one end thereof. The stud is embraced by an annular end of the piston rod **28** of the work cylinder **23**. The work cylinder **23** is carried by an angular support **29** which is mounted upon a base **30** constituting a part of a frame **31**. As shown in FIG. 4, the base **30** has a curved slot **32** which is graduated from 0° to 45°. The radius of the curvature of the slot **32** extends to the center of the stud **27**. The support **29** carries a bolt **33** which is used to fix the support and the work cylinder **23** carried by the support in any desired angular position in the slot **32**.

A lower base plate **34** is located under the plate **26**. The plates **26** and **34** are joined by a centrally located pivot stud **35** which makes it possible for the upper plate **26** to swivel relatively to the lower plate **34**. Slides **36** made of suitable soft material are located between the plates **26** and **34** so as to facilitate the swivelling movement of the plate **26** relatively to the plate **34**.

Furthermore, the two plates **26** and **34** can carry out jointly a transverse movement, namely a movement in a direction perpendicular to that of the web **11** passing over the rollers **12**. For that purpose, the plate **34** is provided with two pairs of downwardly extending sleeves **37** and **38** located upon opposite sides of the plate. The sleeves **37** and **38** have linings of suitable soft material embracing pairs of hardened studs **39** and **40**, respectively. The studs **39** are carried by the frame **31** while the studs **40** are carried by a frame **41** which is L-shaped in cross section and is located opposite the frame **31**.

In use, the operator loosens the bolt **33** at the base of the hydraulic cylinder **23** and moves the cylinder **23** along the groove **32** to the required angle. Then the bolt **33** is tightened again.

When the hydraulic cylinder **23** is now operated, as the result of an error signal at the sensing finger **13**,

it will move the top plate **26** in the direction of its stroke. The pivot stud **35** allows the top plate **26** to pivot on the slides **36**. Since the top plate **26** is connected by the stud **35** to the bottom plate **34**, both plates will move across the web **11**. The sleeves **37** and **38** will slide upon the studs **39** and **40**. Thus the plates **26** and **34** will carry out jointly a movement transverse to the direction of movement of the web **11** and at the same time the plate **26** carries out a swivelling movement relatively to the plate **34**. Since the guide rollers **12** are firmly mounted upon the plate **26**, they will participate in both movements.

The solenoids **20***a* and **20***b* operate in conjunction with their switches **12***a* and **12***b* to provide the required supply of oil and to stop this supply when the operation is accomplished.

It is apparent that this procedure makes possible a quick and easy adjustment of the rollers so as to properly align the web on its passage to a processing equipment. The combination of a swivelling action having an adjustment variable from 1° to 45° with a traversing motion provides a particularly effective action which is promptly transmitted to the web.

It is apparent that the example described above has been given solely by way of illustration and not by way of limitation and that it is capable of many variations and modifications within the scope of the present invention. All such variations and modifications are to be included within the scope of the present invention.

What is claimed is:

1. In a web guide, in combination with a web sensing device, a work cylinder actuated by said web sensing device, at least one roller guiding the web, means adjusting the position of said work cylinder relatively to said roller and means connecting said work cylinder with said roller to cause said roller to carry out simultaneously a swivelling movement and a transverse movement relatively to said web.

2. A web guide in accordance with claim **1**, wherein the means connecting the work cylinder with the roller comprise an upper plate, frames carried by said upper plate and supporting said roller, and a pivot stud carried by said upper plate, said work cylinder having a piston rod having an outer end enclosing said pivot stud.

3. A web guide in accordance with claim **2**, wherein the means adjusting the position of the work cylinder comprise a base having a curved slot and a bolt connected with said work cylinder and extending through said slot to fix the position of the work cylinder relatively to said slot, the radius of the curved slot extending to the center of said pivot stud.

4. A web guide in accordance with claim **2**, further comprising a lower plate located substantially under said upper plate, a centrally located pivot stud interconnecting the two plates, and means guiding said lower plate for transverse movement relatively to said web.

5. A web guide in accordance with claim **4**, further comprising slides located between the two plates.

6. A web guide in accordance with claim **4**, wherein the means guiding the lower plate comprise at least one sleeve suspended from said lower plate, and a stud extending through said sleeve transversely to the direction of movement of said web.

7. A web guide in accordance with claim **4**, wherein the means guiding the lower plate comprise two pairs of sleeves suspended from opposite ends of the lower plate, two pairs of studs extending through said sleeves transversely to the direction of movement of said web, and opposed frames carrying said studs.

References Cited

UNITED STATES PATENTS

3,244,340	5/1966	Fife	226—22
3,317,101	5/1967	Himrod	226—19

M. HENSON WOOD, JR., *Primary Examiner.*

RICHARD A. SCHACKER, *Assistant Examiner.*

U.S. Cl. X.R.

226—22