

[54] **APPARATUS FOR WEB EDGE ALIGNMENT**

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[58] Field of Search93/20, 82; 226/21, 22

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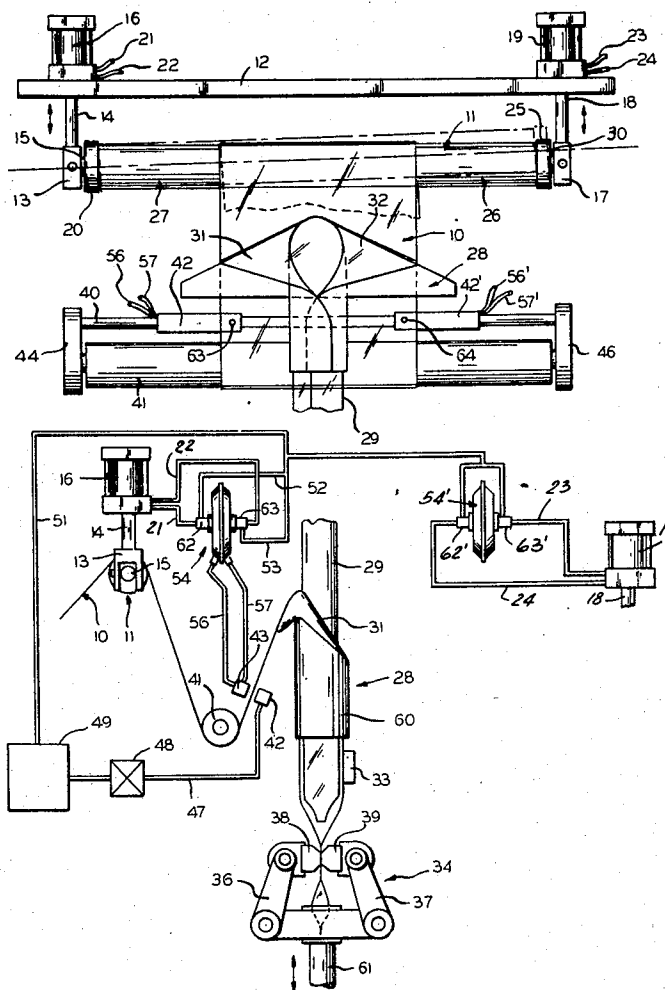
Primary Examiner—Wayne A. Morse, Jr.

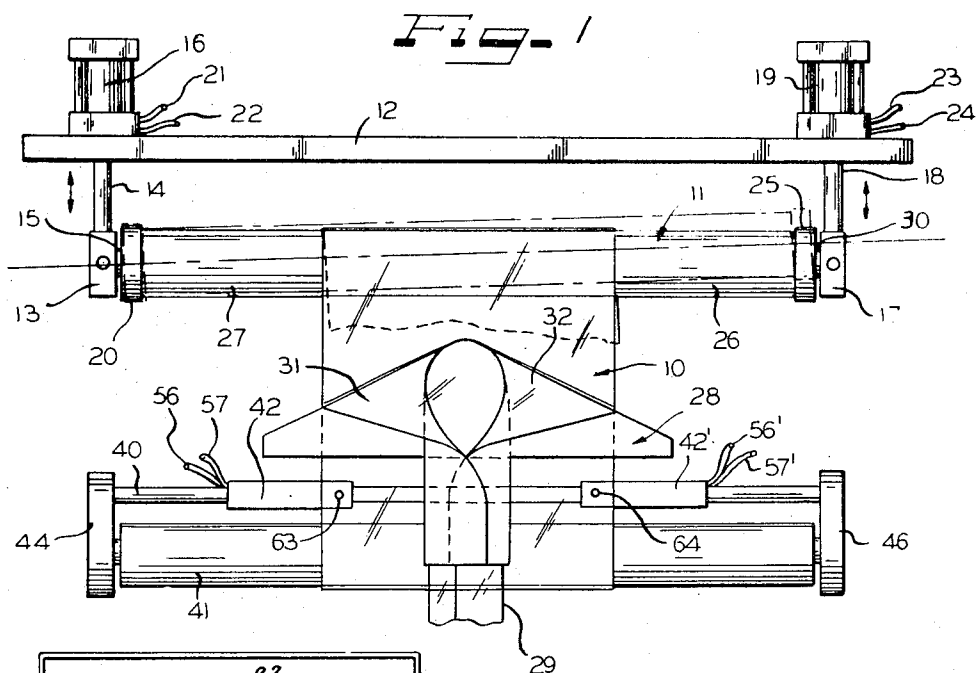
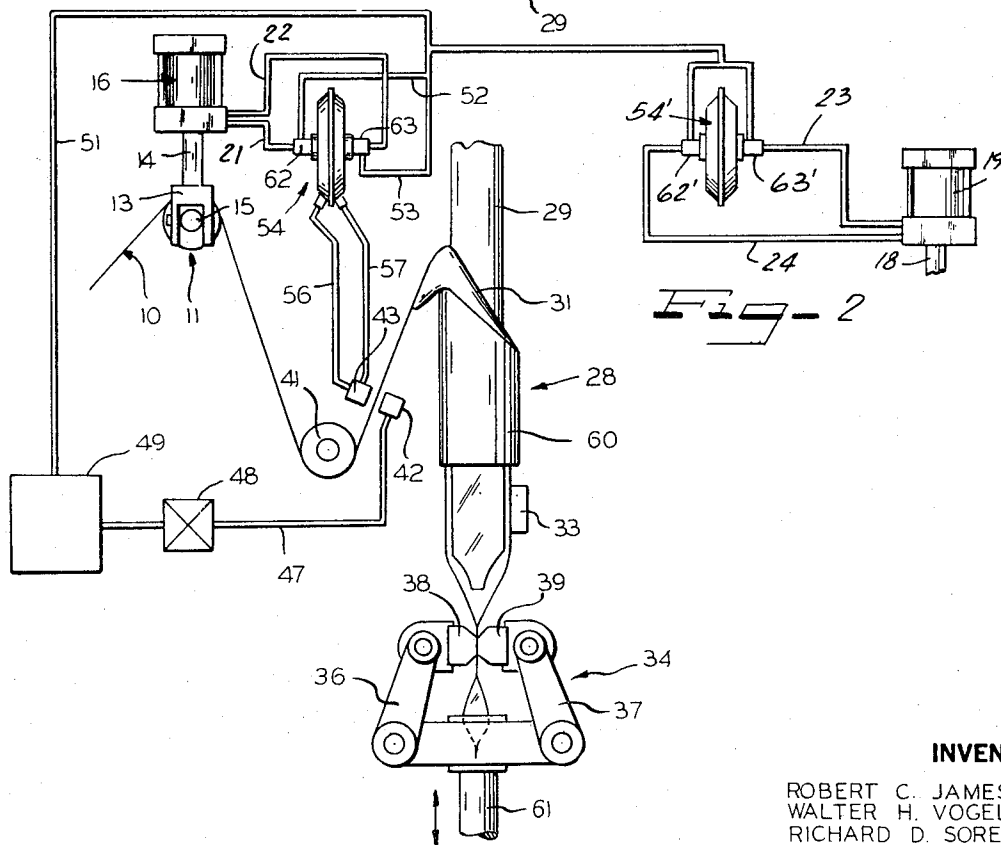
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[57] **ABSTRACT**

A packaging machine having a former and a web edge aligning system for aligning a web such as a plastic film which is to be formed into containers, is disclosed. A shiftable web guide roller has adjustable cylinders mounted at its opposite ends for independently adjusting the ends of the roller so as to move the web as it passes over the roller. Fluid sensors are mounted on each side of the web after it passes over the roller and detect when the web edges are properly aligned. If the web is misaligned, the sensors control valves to operate the cylinders so that the film is again centered and aligned.

1 Claim, 2 Drawing Figures





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APPARATUS FOR WEB EDGE ALIGNMENT

RELATED APPLICATIONS

This application is a divisional of our application Ser. No. 757,600, filed Sept. 5, 1968, now U.S. Pat. No. 3,592,372, issued July 13, 1971.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates in general to methods and apparatus for forming sheet material into bags by forming the sheet into a generally cylindrical shape and sealing the edges and then filling the bags thus formed and sealing them.

2. Description of the Prior Art

Prior art bag-forming machines have comprised forming shoulders over which webs of plastic material have been passed to form bags. The edges of the material are sealed after passing over the forming shoulders and the bags are filled and sealed between adjacent containers before being separated.

SUMMARY OF THE INVENTION

The present invention comprises the method and apparatus for aligning the web edges of plastic material which is to be formed into bags and comprises sensing means which are operatively associated with the edge of the web and a control a shiftable web guide roller to adjust the position of the web. The web guide roller may be mounted with its opposite ends independently controlled by fluid cylinders that respond to the sensors along the edges of the web. The edge alignment sensors comprise fluid receiving means that are positioned so as to receive fluid from discharge nozzles when the web becomes misaligned. The sensors control pistons attached to the shiftable web guide roller so that the web is properly aligned. Thus, the invention automatically and continuously maintains alignment of the web guide without manual adjustment. Since the web is continuously aligned, the forming shoulder may be less complex than those used with previous machines which did not have the aligning mechanism of the present invention. This results in a substantial saving. Other objects, features and advantages of the present invention will be readily apparent from the following detailed description of certain preferred embodiments thereof taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view of the web edge aligning mechanism according to the invention, and

FIG. 2 is a side view of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 1 and 2 illustrate the apparatus for web edge alignment according to this invention wherein as shown in FIG. 1 a sheet of film 10 passes over an alignment roll 11 which is supported at both ends on suitable bearings 20 and 25. Supporting shafts 15 and 30 are connected to the bearings 20 and 25, respectively, and are mounted in brackets 13 and 17. The bracket 13 is supported on a piston shaft 14 which is connected to a piston that moves in a cylinder 16. The bracket 17 is connected to the piston shaft 18 that has a piston that

moves in the cylinder 19. The cylinders 16 and 19 are attached to a support 12 and adjustments of the piston shafts 14 and 18 allow the roller 11 to be adjusted relative to the support member 12.

The film 10 passes over the roller 11 and down over a roller 41 which has bearings 44 and 46 that are supported by a suitable frame member, not shown. The film 10 then passes up between fluid sensing means 43 and 43' and aligned nozzles 42 and 42'. The nozzles 42 and 42' direct a stream of fluid such as air, toward the sensing means 43 and 43'. When the film 10 is between the nozzle 42 and sensing means 43 only static fluid pressure is applied to the sensor 43. If the plastic film 10 moves to one side relative to FIG. 1 so that the film does not intercept the fluid from the nozzle 42, the fluid stream is intercepted by the sensor 43 and causes the roller 11 to be tilted to move the film 10 to realign it.

The film 10 passes up through the sensing mechanism and over a forming collar designated generally as 28 which is formed with shoulders 31 and 32. The forming and support means 29 extends down through the collar 28 and the film 10 passes over the collar and down through its lower portion 60. A sealer 33 engages the edges of the sheet 10 after it passes through the collar 28 and seals the edges to form a cylinder of plastic film. A transverse sealing means 34 has sealer portions 38 and 39 on either side of the film below the collar 28 and seals the film to provide individual packages for produce or other material. The sealers 38 and 39 seal the packages above and below the produce and subsequently the packages are separated by cutting along the sealed portions which have been formed by the sealers 38 and 39. The sealer 34 is mounted on a suitable reciprocating shaft 61 to allow the sealers 38 and 39 to move up and down with the containers.

Each of the fluid sensors 43 are connected to an air pressure amplifier diaphragm 54 which senses the differential pressure in lines 56 and 57 of the sensors 43 and 43'. The line 57, for example, may sense the static pressure and the line 56 may sense the dynamic pressure of fluid received from the nozzle 42. Differential pressure in lines 56 and 57 will cause the diaphragm 54 to actuate air supply control switches 60 or 63 which control the fluid supply from tank 49 to one of the cylinders 16 or 19. The fluid supply 49 may comprise an air pressure tank which supplies fluid through a reducing valve 48 to line 47 which is connected to the fluid nozzles 42 and 42'. Fluid line 51 connects fluid supply 49 to a pair of conduits 52 and 53 which are connected to the air supply control switches 62 and 63, respectively. Fluid line 21 is connected from the air supply control switch 62 to the cylinder 16 and a fluid line 22 is connected from cylinder 19 to the air supply control switch 63.

In operation, the machine is started and the web 10 passes over the alignment roller 11 and idler roller 41 between the nozzles 42 and 42', respectively, and the sensors 43 and 43'. If the film 10 is between the nozzles 42 and 42' and their associated sensors 43 and 43', the position of the cylinders 16 and 19 will not be adjusted because the film or web 10 is aligned with the forming collar 28. However, if one edge of the web 10 moves so that one of the nozzles 42 or 42' supplies fluid to the

sensing means 43 or 43', the diaphragm 54 or 54' will move and fluid will be supplied to cylinder 16 or 19 and move the end of roller 11 to correct misalignment of the web. As the end 27 of the roller 11 moves, it will cause the web 10 to move and be recentered between the sensors.

If the nozzle 42' supplies fluid to the sensor 43' the cylinder 19 will be energized to cause the end 26 of the roller 11 to be adjusted until the web 10 is again centered.

Thus, when a web edge is properly aligned with the openings of the sensors, the air circuit for operating the cylinder for actuating the associated piston will be inactive, but when the edge moves sufficiently to expose enough of the opening of a sensor to cause it to respond, the diaphragm operating valve will be actuated which in turn will evergize the associated cylinder and piston to make a corrective adjustment of the position of the web guide roller so that the film will be properly positioned on the forming shoulders. Each of the air sensors operate in the same manner.

Although in the embodiment illustrated in FIGS. 1 and 2 the web guide roller is adjusted in a more or less vertical plane, it is to be realized that the principles of the invention are also applicable to machine in which the roller is adjusted in a horizontal plane to accomplish the same results.

One of the principal advantages of the present invention is that the forming shoulder 28 may be formed much simpler because the plastic web is maintained centered. Thus, a less sophisticated forming shoulder may be used which may be manufactured with less labor and cheaper than those previously used.

The present invention allows a cheaper forming shoulder to be used. Even a perfect folding shoulder

presents difficulties, particularly in tracking with a packaging material that has exaggerated, but normal imperfections. Some of the imperfections are center droop, edge droop, and gauge variation. The present invention not only allows a cheaper forming shoulder but also allows the use of less critical packaging materials.

It is to be realized that the nozzles 42 and 42' and their related sensors 43 and 43' may be adjusted relative to the support 40 by thumb screws 63 and 64 to allow sheets of different widths to be centered by the invention.

Although minor modifications might be suggested by those versed in the art, it should be understood that we wish to embody within the scope of the patent warranted hereon all such modifications as reasonably and properly come within the scope of our contribution to the art.

We claim:

1. In a packaging machine for forming bags:

a former having a forming shoulder for forming a web of material into tubular form;

a guide roller over which the web passes mounted on the upstream side of the former for controlling movement of the web onto the forming shoulder;

sensing means mounted adjacent said web and sensing its position;

means for adjusting the guide roller connected to said sensing means to move said web relative to the sensing means and for training the web onto the forming shoulder in a controlled manner; and comprising a first cylinder mounted on said machine, a first piston mounted in said cylinder and one end of the guide roller rotatably supported by the first piston.

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