ABSTRACT
A web break detector system employs web detectors arranged in groups spaced along the path of a moving web and spanning its width. Each detector which senses web for a predetermined time becomes active and an active detector in any detector group turns on a panel light associated with that group. When a detector no longer senses web because of a break or undue slack in the web, the detector generates a signal which causes the system to stop the process being monitored, indicate at which location in the path the break first occurred, indicate other locations in the path at which subsequent breaks occurred and activate web severing devices to sever the web at selected locations depending upon where the breaks occurred.

13 Claims, 4 Drawing Figures
WEB BREAK DETECTOR SYSTEM

BACKGROUND OF THE INVENTION

The present invention relates to a system for use in association with a press or other web processing equipment which will cause the equipment to shut down if a break or significant slack develops in the web.

In many industries, webs of paper, fabric, plastic film, foil and the like are processed in large machines through which the web moves continuously at high speed. In the event of a break in the web, it is often desirable to stop all or certain portions of the apparatus to prevent web waste, damage to equipment and to minimize down time.

Various forms of web-sensing devices are available to detect web breakage or undue slack in the web at a particular location. Perhaps the simplest device consists of a wire or arm mounted so as to be supported by the web. In the event of a web break, the arm, losing such support, actuates a switch which shuts off the machine and/or sounds an alarm. Other prior systems use noncontacting devices such as a photoelectric detector in place of the arm to sense the presence or absence of web.

In many applications, the web follows a complicated, tortuous path through the printing press or other processing apparatus and, also, the web may follow alternate paths through the equipment on different runs. Accordingly, many sensor stations are required to properly monitor all possible web paths and before each run, those sensors along unused web paths must be deactivated. Further, since a web may be wider than the area under observation by a single sensor, several sensors spaced across the web must be required at each monitoring station along the web path. Then when a narrow web is processed, those sensors at the ends of each group not opposite web must be deactivated. Thus, it takes appreciable time to ready the prior equipment prior to each run. Also, when a break does occur, it is sometimes difficult to determine readily which of the many sensors detected the break.

In practice, when a break occurs in the web, that first break may produce tension upsets in the web that cause other breaks at various points in the web path through the machine being monitored. These breaks may be accompanied by tearing of the web, unraveling of the web and wrapping of the web around various rolls in the machine, all of which cause waste and could damage components of the machine. Accordingly, in many cases, as soon as the break occurs, it would be desirable to shut the web at other locations to protect the remainder of the web and the web handling equipment. However, the locations of the sever points which most effectively protect the web depend upon where the breaks occur. Prior web break detector systems do not necessarily sever the webs at the proper places following a web break or breaks. Thus, in many cases, the web is severed unnecessarily, causing excessive waste and down time.

Additionally, prior systems make no attempt to distinguish between the first break in the web caused by maladjustment or malfunction of the machine and subsequent breaks not due to such factors. This makes it quite difficult to determine where in the machine the first break occurred so that corrective measures can be taken.

Still other prior systems are disadvantaged because they do not always discriminate between a break in the web and a mere brief slackening of the web. Therefore, sometime those detector systems shut down the processing equipment unnecessarily, causing loss of time and, sometimes, breaks in the web.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a web break detector system which continuously monitors a moving web and, in the event of a web break or undue slack, immediately and reliably stops the associated web processing equipment.

Another object of the invention is to provide a system of this type which monitors the web at different locations in the associated machine and immediately indicates the location in the machine of any and all web breaks.

A further object of the invention is to provide a detector system which, in the event of multiple web breaks, indicates where in the machine being monitored the first break occurred.

A further object is to provide a system of this general type which indicates the actual path of the web through the associated equipment.

Yet another object is to provide a web break detector system which, in the event of a web break or breaks, automatically severs the web at the most effective locations in the web path to prevent further damage to the web.

A further object of the invention is to provide a web break detector system which reliably discriminates between actual breaks in the web and a mere temporary slackening thereof.

Still another object is to provide a system of this type which automatically accommodates itself to each web run so that setup time is minimized.

Other objects will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the invention will be indicated in the claims.

Briefly, the present system senses the presence or absence of web at a number of different monitoring stations located along the path of web travel through the processing apparatus being monitored. In some cases, the web may follow different paths through the apparatus so that, in order to avoid rearranging the monitoring stations prior to each run, stations are located along all of the possible web paths through the machine, although only some of these may be active during a given run.

Each monitoring station includes one or more detectors spaced along a mounting bar positioned perpendicular to the path of web travel and close to the web so that the web is monitored across its full width. In a given case, a run may consist of narrow web so that all of the detectors at each monitoring station may not be needed. However, in order to avoid having to alter the detector setup before each run, all of the monitoring stations have a sufficient number of detectors to be able to monitor the widest web that is likely to be processed by the machine.

The detectors at each monitoring station provide output signals and the system is arranged so that the output signal from each detector is processed only if
that detector senses the presence of web for a reasonable time, e.g. thirty seconds. Thus, those detectors at a station which never sense web because the web is not wide enough to pass under those detectors do not generate outputs which are processed and they can be ignored. Likewise, those detectors at stations along unused web paths on a given run can be ignored. When one or more detectors at a monitoring station senses the presence of web for the required time, a light on a conveniently located display panel is turned on, thus indicating that the particular monitoring station is active and is sensing web. All of the monitoring stations operate in a comparable way to control corresponding panel lights.

Thus, during the web-up process, as web is fed past each station, the associated panel light will be turned on after thirty seconds.

Desirably, the display panel includes a schematic of the web processing apparatus being monitored and the various panel lights are positioned on the schematic so as to reflect the actual locations of the corresponding monitoring stations in the actual apparatus. Accordingly, when the web-up process is completed for each run, the panel lights corresponding to those stations which sensed web for the required time are illuminated, while the panel lights corresponding to those stations positioned along web paths through the apparatus which are not being used during the run are not illuminated. Therefore, the display panel graphically indicates the actual path of the web through the apparatus during the run.

Should a detector which is active fail to see web for a selected period of time indicative of excessive web slack or an actual web break, the system immediately stops the web processing apparatus and may also sound an alarm. In addition, the system actuates various response means such as web markers or web severing devices positioned at strategic locations along the web paths through the apparatus.

The system is preprogrammed so that, when any monitoring station detects a web break, the web can automatically be severed at those locations along its length that are most effective to prevent web wrap-up around rolls that might cause damage to the machine. Thus, a web break detected by one station may trigger one group of web severing devices, while a break at another location may trigger another group of severing devices, to most effectively isolate the break. In the event of multiple breaks in the web, the system can actuate the severing devices deemed best able to protect against the consequences of all of the breaks.

When a monitoring station detects a web break, this fact is immediately reflected on the display panel in one of two ways. If the monitoring station detects the first break in the web, the system causes the panel light associated with that monitoring station to flicker. On the other hand, if the monitoring station detects a break which is not the first break in the web, then the system turns off the panel light associated with that monitoring station.

Accordingly, by glancing at the display panel, personnel can tell where in the apparatus the web has broken. Moreover, the display allows the operator to distinguish between the first web break which is usually due to external causes such as paper conditions or operator error and subsequent breaks which usually result from the first web break. This feature is invaluable for pinpointing the causes of emergency stop situations and minimizing the down-time of the apparatus being monitored.

Thus, the present system at once continuously monitors a moving web for breaks in the web, automatically takes appropriate corrective action depending upon the circumstances surrounding each break, and provides a current display of web status. Accordingly, it should be a very useful tool in many web processing applications.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a block diagram showing the different elements of the web break detector system;

FIG. 2 is a diagrammatic view representing both a typical web processing installation incorporating the FIG. 1 system and the system display panel for that installation;

FIG. 3 is a diagrammatic view showing the switch matrix used in the FIG. 1 system in greater detail; and

FIG. 4 is a block diagram showing elements of the system in greater detail.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Refer first to FIG. 2 of the drawings which shows a display panel indicated generally at 10 which bears a schematic diagram showing all of the elements of a typical web processing installation to be monitored, in this case a printing press. The press installation includes a pair of splicers for supplying one or two webs through infeeds which feed paper under uniform tension to a printing press consisting of five printing units P1 to P5. During successive runs, each web may pass through one or more printing units, depending upon the printing circumstances. Upon leaving the press, each web is guided through one of a pair of heated dryers and thence to a chiller to return the paper to room temperature. Following this, the web is fed to a folder which folds and cuts it to form signatures. Other machinery may be included for slitting, gathering, tenanting, etc. as represented by block B upstream of the folder. The signatures arranged in a stack are then taken to a bindery where they are bound into books. In this particular instance, we will assume that one web is being supplied from splicer 1 and passes through press units 1, 2 and 5 and dryer 1 on the way to the folder. Another web may, of course, be routed through units 3 and 4.

The system for monitoring the web routed through the installation diagrammed on display panel 10 includes several monitoring stations positioned at selected locations along all possible paths of web through the illustrated apparatus. We have indicated the locations of ten such stations by the placement of panel lights (preferably light-emitting diodes) S1 to S10 relative to the named blocks representing the different components of the installation. However, in actual practice, there may be many more or fewer such stations.

The installation in this example includes the usual emergency stop circuitry for stopping the press and severing devices positioned along the web paths for severing the web in the event of a break. In this instance, only three severing devices are provided, their
locations being indicated on panel 10 by arrows K1 to K3. Of course, in an actual installation, there may be many more or fewer severing devices and they may be variously placed along the web paths.

Turning now to FIG. 1 of the drawings, the web break detector system comprises ten monitoring stations positioned along the web paths through the press as described above. All of the stations and their associated logic circuitry are identical and they will be described in detail later with reference to FIG. 4.

Each monitoring station includes a bar 12 which is mounted close to the web path through the station and transverse thereto. The bars are somewhat wider than the width of the path. Each bar supports one or more detectors whose output changes state, depending upon whether it senses web or not. We have illustrated three detectors D1 to D3 on bar 12 although, in a given instance, there may be more or less depending upon the type of installation. As a general rule, there should be enough detectors at each station to monitor the full width of the widest web likely to be run through the press.

While many types of detectors can be used in this system, a particularly suitable one for this purpose is disclosed in my copending application Ser. No. 411,413, filed Oct. 31, 1973, entitled WEB BREAK DETECTOR now abandoned. The other monitoring stations 2 to 10 have similar detectors mounted on bars positioned adjacent the web.

When a detector at a monitoring station detects the presence of web, it emits a signal to a channel logic section associated with the detector. If the logic section receives an output signal from a detector for a given time interval, e.g. 30 seconds, it processes that signal. On the other hand, if the channel logic section does not sense the output signal from a detector for the requisite time, it does not process that signal and, therefore, that detector exercises no control function and may be ignored. This situation will occur if the web being fed through the press is so narrow that it spans only one or two of the three detectors at the monitoring station. It will also occur when the detectors are at a monitoring station situated along an unused web path through the press, i.e. through press sections P3 and P4 in this example. In the present system, then, absolutely no setup time is required to accommodate the system to webs of different widths or to different web paths through the press.

If a channel logic section receives an output signal from a detector at a station for the required thirty seconds, it emits an ACTIVE signal to a bar logic section associated with that station. Thereupon, the bar logic section turns on the panel 10 light corresponding to that station.

Thus, for example, when any one of detectors D1 to D3 at station 1 senses web for thirty seconds, the panel light S1 is turned on. Likewise, when any one of the three detectors at station 2 senses web for the required time, panel light S2 becomes lit, and so on. It follows, then, that the initial status of the panel lights following web-up indicates which monitoring stations are operative. Moreover, as discussed previously, the status of all of the lights on the panel 10 indicate the path of the web through the press. Thus, the fact that web is not feeding through the press sections P3 and P4 in this example is immediately apparent because panel lights S5 and S6 are not lit. This is indicated in FIG. 2 by crosses on those lights. During web-up, then, the operator can insure that the web is following the proper path through the press by observing the corresponding sequence of panel lights as the station lights are turned on by the advancing leading edge of the web.

If a detector at a given station, once "active," fails to sense the presence of web for a predetermined time indicative of excessive slack or an actual web break, the channel logic section associated with the detector issues a BREAK signal to the bar logic section for that station. The BREAK signals from all channel logic sections are also applied to a common break sum section.

Upon receipt of a BREAK signal from any channel logic sections, the break sum section issues a SUMMED BREAK signal which trips a relay 14 to immediately stop the press. That signal may also turn on an alarm 16 or panel light (not shown) to apprise the operator that the web has broken. The SUMMED BREAK signal also turns on a clock that generates a CLOCK signal which, along with the SUMMED BREAK signal, is fed to the bar logic sections for all monitoring stations. Each such section compares the BREAK, SUMMED BREAK and CLOCK signals and determines whether the web break detected at its monitoring station is the first web break or a subsequent web break.

If a monitoring station is the first one to detect a break, then its associated bar logic section causes the corresponding panel light to flicker on and off at the clock rate. On the other hand, if the station in question is not the first one to detect a break, its bar logic section turns off the corresponding panel light. For example, and referring to FIG. 2, if the first web break is sensed at station 2 and then station 1 detects a subsequent web break, panel light S2 will flicker and then panel light S1 will go out. The remaining panel lights (except lights S5 and S6 which were never armed) will stay on assuming the press is immediately stopped. Thus, the operator can tell by a glance at the display panel 10 the approximate location of the first break and all subsequent breaks in the web.

The BREAK signals from all of the station channel logic sections are also applied to a sever logic section which is preset to actuate selected ones of the severing devices K1 to K3, depending upon which monitoring station(s) detected the break(s). For example, referring to FIG. 2, if monitoring station 3 detects a web break, it may be appropriate to actuate severing devices K1 and K2 to isolate the web entering and leaving the press units. On the other hand, if a break is detected by station 9, it may be sufficient to actuate severing device K3 to sever the web leaving the chiller. In any event, the sever logic section is preprogrammed so that a break sensed by each monitoring station 1 to 10 will result in the actuation of the correct severing devices K1 to K3 that will sever the web at the most effective locations to minimize web waste and damage to the press parts that otherwise could be caused by a break at that location.

A variety of logic schemes may be employed to accomplish the above-stated objectives, the following logic arrangement being one of these.

**THE CHANNEL LOGIC SECTIONS**

Referring to FIG. 4, all station channel logic sections are the same. Therefore, for purposes of this description, we will only describe in detail the channel logic section 1 associated with detector D1 at station 1.
The output of detector D1 is applied via a NOR circuit 22 to a 30-second timer 24. The output of timer 24 is connected to the SET input of a latch 26. The ONE output of flip-flop 26 is, in turn, applied to the RESET input of a second latch 28. The SET input of flip-flop 28 also receives the output of NOR circuit 22. The ACTIVE signal for this channel 1 appears at the ZERO output of latch 26 and the BREAK signal for section 1 appears at the ONE input of flip-flop 28.

The present system is readied initially by the operator depressing a reset button 32 (FIG. 1) momentarily. Button 32 controls a reset buffer 34 which provides two outputs, namely, a RESET signal (R) and a RESET signal (R'). When button 32 is not depressed, the RESET signal is a logic ONE and the RESENT signal is a logic ZERO. On the other hand, when the button is depressed, these logic values are reversed. The RESET signal is applied to the reset input of latch 26 in each channel logic section and the RESET signal is applied to NOR circuit 22 in each such section. These same signals are also applied to other parts of the system as will be described later.

Initially, when button 32 is depressed and there is no web present under the detector D1, both inputs to circuit 22 are ONE so that latch 28 is set so that a logic ONE is present at its output. The section 1 BREAK signal corresponds to a ZERO level there. When button 32 is released, a RESET signal is applied to latch 28 so that its ZERO output is at a ONE level. A section 1 ACTIVE signal corresponds to a ZERO level at this latch 28 output.

When detector D1 senses web, timer 24 commences timing. After 30 seconds, the timer output switches latch 26 which thereupon emits an ACTIVE signal. The ACTIVE signal is applied to the associated bar logic section as will be described presently which thereupon turns on station 1 panel light S1. At this point in time, latch 28 remains in the same state so that no BREAK signal is present.

If detector D1 should cease sensing web, its output switches to logic ONE so that latch 28 changes state and emits a BREAK signal to the bar 1 logic section and the break sum section.

THE BREAK SUM SECTION

The break sum section includes an OR circuit 42 which receives the BREAK signals from all of the monitoring stations Nos. 1 to 10. Any BREAK signal is applied by an OR circuit 42 to set a flip-flop 44 which thereupon develops a logic ONE SUMMED BREAK signal. Flip-flop 44 is reset initially by a RESET signal from reset buffer 34.

In addition to stopping the press and severing the web, the SUMMED BREAK signal turns on a clock 46 which produces a 2 Hz clock signal. The SUMMED BREAK and CLOCK signals are both applied to all of the station bar logic sections to cause those sections to properly control their associated panel lights to indicate that a station has detected a first or a subsequent web break.

THE BAR LOGIC SECTIONS

The bar logic sections associated with each station are identical. Therefore, we will describe in FIG. 4 only the bar logic section associated with station 1. The section includes an OR circuit 52 which receives the ACTIVE 1, 2 and 3 signals from channels 1 to 3 of station 1. The output of OR circuit 52 is applied to one input of a NOR circuit 56 whose output controls the panel light S1.

A second OR circuit 54 receives the BREAK 1, 2 and 3 signals from those same three channels. The output of OR circuit 54 is applied to a NOR circuit 58 whose output provides the other input to the just-mentioned NOR circuit 56. NOR circuit 58 also receives the output of another NOR circuit 62 which, in turn, receives CLOCK signals from clock 46 in the break sum section. The other input to NOR circuit 62 arrives from the ZERO output of a latch 64. This latch is initially reset by a RESET signal from buffer 34 and it changes state in response to a signal from a NOR circuit 66. The two inputs to NOR circuit 66 are the signal from OR circuit 54 and the SUMMED BREAK signal from the break sum section.

THE OPERATION OF THE CHANNEL AND BAR LOGIC SECTIONS

When starting the system initially or following a web break, the operator actuates the reset button 32 which applies a RESET signal (R) to the reset inputs of latches 26 in all of the station channel logic sections and also to flip-flop 44 in the brake sum section and a RESET signal (R') to the NOR circuits 22 in all of the channel logic sections and the latches 64 in all of the bar logic sections.

It any detector at a given station, say, detector D1 at station 1, detects web for the requisite 30-second period, an ACTIVE signal is applied to the NOR circuit 56 in the station's bar logic section which turns on panel light S1. This light will remain on as long as detector D1 and the other armed detectors at station 1 detect web.

If there is a web break so that detector D1 no longer senses web, a BREAK signal issues from latch 28. That, in turn, initiates a SUMMED BREAK signal and a CLOCK signal from the break sum section which are applied to NOR circuit 66 and NOR circuit 62, respectively. The BREAK signal is also applied to NOR circuits 58 and 66. If the break is the first one detected by the system, then the BREAK and SUMMED BREAK signals applied to NOR circuit 66 are both ZERO so that latch 64 is switched so that its output to NOR circuit 62 is ZERO, thereby enabling NOR circuit 62 so that it passes CLOCK signals via NOR circuit 58 to NOR circuit 56. This causes the lamp S1 to blink on and off at the clock rate, thus signaling the detection of a first web break at station 1.

On the other hand, if the web break detected at station 1 is not the first break, a SUMMED BREAK signal will have appeared at NOR circuit 66 so that latch 64 does not change state. Resultantly, NOR circuit 62 inhibits the CLOCK signal. The output from NOR circuit 58 is thus a ONE so that lamp S1 is turned off, thus indicating detection of a subsequent break in the web.

The logic sections associated with the other monitoring stations function in the same way to appropriately control their panel lamps S2 to S10.

THE SEVER LOGIC SECTION

Referring again to FIG. 1, the sever logic section of the system consists of a switch matrix 72 which receives the BREAK signals from all of the station channel logic sections in the system. The switch matrix is preprogrammed to issue control signals to one or another of the sever relays on the press which control severing devices K1 to K3, depending upon from which stations the BREAK signals originate. The switch matrix 72 can
be any suitable type capable of being preset to route the various break signals to the appropriate sever relays.

FIG. 3 illustrates a particularly convenient switching arrangement. It consists of a switch panel 74 having a multiplicity of pin sockets 76. The sockets 76 are arranged in rows and columns corresponding to the number of monitoring stations in the system and the number of severing devices. Thus, in the present case, there are ten rows of sockets 76 labeled S1 to S10 arranged in three columns K1 to K3.

The break signals from the ten station channel logic sections are applied to terminals T1 at the side of the panel board 74, while the leads to the relays controlling severing devices K1 to K3 are connected to terminals T2 at the top of the panel. Conductors inside the panel are connected between the break signal terminals T1 and the sever relay terminals T2 by way of the various sockets 76. The connections are such that any break signal terminal can be connected to any sever relay terminal by inserting pin-type diodes P in the appropriate sockets 76.

Thus, in the examples given at the beginning of the description, to make severing devices K1 to K3 respond to a break detected at station 3, a diode P is inserted into the socket 76 defined by the coordinates K1, S3 and K2, S3 as indicated by the crosses on those sockets thereby completing the connections between those pairs of terminals. On the other hand, to preset the switch 74 so that the monitoring station 9 actuates only severing device K3 when it senses a web break, a diode P is inserted into the socket 76 defined by the coordinates S9, K3 thus connecting the terminal for S9 and K3.

Using switch 74, any severing device can easily be arranged to respond to a break detected by any monitoring station. Of course, if desired, the number of conductive paths in the panel 74 to connect the terminals and sockets can be minimized by using well-known coincidence gating techniques.

As seen from the foregoing, then, the present web break detector system should materially reduce the amount of web wasted when a malfunction occurs in a press or other processing apparatus. The system immediately stops the press and severs the web at strategic locations in the press that are most appropriate to protect against the particular web break or breaks. The system also immediately apprises the operator not only of the location of all breaks in the web, but, also, it pinpoints the site of the first break so that any necessary adjustments or repairs can be made promptly. Accordingly, the system should minimize down-time and also reduce maintenance costs. Further, the system does not have to be adjusted prior to each press run to accommodate the system to the particular size web or the particular path of the web through the press. Consequently, it does not increase press setup time.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic features of the invention herein described.

I claim:

1. A web break detector system comprising
   A. two or more sensors for sensing web, each said sensor emitting an output signal when it detects the absence of web,
   B. means for positioning said sensors along a web path,
   C. indicating means corresponding to each sensor for indicating the detection by that sensor of the absence of web, and
   D. means for comparing the times of occurrence of said output signals, said comparing means applying a first signal to the indicating means corresponding to the sensor which first detects the absence of web and simultaneously applying a second signal to the indicating means corresponding to the sensors which subsequently detect the absence of web so that the indicating means automatically and simultaneously provide a display which distinguishes between the location in the web path where the absence of web was first detected and the locations in the web path where the absence of web was subsequently detected.

2. The web break detector system defined in claim 1 and further including means for inhibiting the output signal from each sensor until said sensor detects web for a predetermined time so that any sensor positioned at a portion of the web path where web is not routed cannot signal the presence or absence of web.

3. The web break detector system defined in claim 1 and further including means responsive to an output signal from any sensor for generating an emergency stop signal for stopping the machinery through which the web is routed.

4. The web break detector system defined in claim 1 and further including means responsive to the output signal from any sensor for generating a signal to actuate web striker means positioned adjacent the web path.

5. The web break detector system defined in claim 4 wherein the striker control means include
   A. electrical conductors for connecting the sensor to one or more web strikers disposed along the web path, and
   B. means for coupling the output signal from any sensor selectively to the conductors.

6. A web break detector system comprising
   A. one or more monitoring stations for sensing web, each said station emitting a first output signal when it detects the presence of web for a predetermined time and a second output signal when it detects the absence of web after said time,
   B. means for positioning said stations along a web path, and
   C. indicating means corresponding to each station and responsive to its first signal for indicating presence of web at that station and responsive to its second signal for indicating the absence of web at that station.

7. The web break detector system defined in claim 6 wherein a station comprises two or more noncontacting-type web detectors, any of which provide the station output signals, said detectors being spaced apart so that the station monitors the full width of the web path.

8. A web break detector system comprising
   A. web sensing means for monitoring web in a web path and producing an output signal in response to the absence of web, and
B. means connected electrically to the sensing means for inhibiting the output signal until said sensing means sense web for a predetermined time so that sensing means positioned at a portion of the web path where web is not routed does not signal the presence or absence of web.

9. The system defined in claim 8 and further including
A. means defining a web path, and
B. means for positioning the sensing means at a selected location along the web path so that they indicate the absence of web at that location after said predetermined time.

10. The system defined in claim 9 and further including
A. two or more of said sensing means positioned at selected locations along the web path, and
B. indicating means responsive to the second condition of each of the sensing means so as to indicate the status of web at each of the selected locations.

11. The system defined in claim 10 and further including
A. means for determining which of the two sensing means first assumed the second condition, and
B. means responsive to the determining means for causing the indicating means to substantially simultaneously indicate by a first indicator the location where the absence of web was first detected and by a second different indicator the location where the absence of web was subsequently detected.

12. A web break detector system comprising
A. two or more sensors for sensing web, each said sensor emitting an output signal when it detects the absence of web,
B. means for positioning said sensors along a web path,
C. indicating means corresponding to each sensor for indicating the detection by that sensor of the absence of web,
D. means for comparing the times of occurrence of said output signal and applying a first signal to the indicating means corresponding to the sensor which first detects the absence of web so as to indicate the location in the web path where the absence of web was first detected, and
E. web striker control means responsive to the output signal from any sensor for generating a signal to actuate web striker means positioned adjacent the web path, said striker control means including
1. electrical conductors for connection to one or more strikers disposed along the web path,
2. a rectangular array of two terminal switches arranged in columns and rows, the number of switches in each column corresponding to the number of monitoring stations in the system, and the number of switches in each row corresponding to the number of web strikers in the system,
3. means for applying the output signals from said stations to one terminal of different switches in a switch column,
4. means for connecting the other terminal of switches in a said row to different ones of said conductors so that by turning on selected ones of said switches, the signals from said monitoring stations can be applied variously to selected one of said conductors, and
5. means for electrically isolating each switch from the others.

13. The web break detector system defined in claim 12 wherein each switch comprises
A. a socket having a pair of conductor segments electrically insulated from one another, and
B. a diode for insertion into the socket to make an electrical connection between said pair of segments, while providing the electrical isolation.