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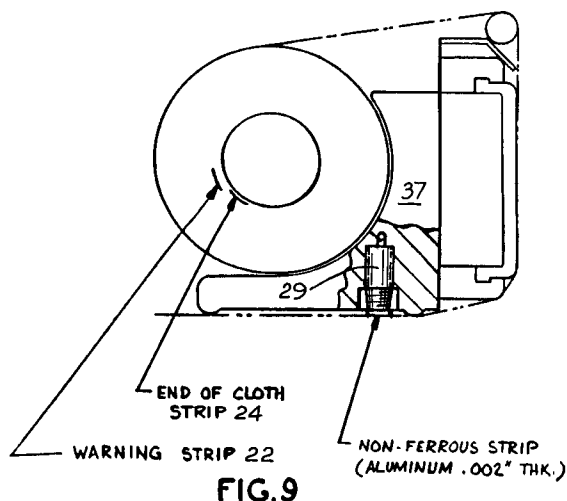
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Nottingham NG1 1LE (GB)(54) **Method and system for determining the end of a cloth roll for use in blanket cleaners for printing presses.**

(57) Method for determining the end of a cleaning cloth C (which is non-metallic and non-magnetic) for cleaning the blanket cylinder of a lithographic press and device therefor, wherein the cloth C has indicia 22, 24 positioned at a predetermined distance from the end of the roll of cloth which are arranged to pass a sensor 29 mounted to sense the indicia as the cloth C is fed for cleaning the roll. An alarm signal (which may be audible or visible) is given to alert the press operator when either end of the indicia 22, 24 is detected.

**EP 0 529 764 A1**

This invention relates to an improvement in cleaning the blanket cylinder of a printing press. More particularly, the invention relates to a method and system for altering uses to a first predetermined distance from the end of the cloth and for altering the uses to a second position immediately adjacent the end of the cloth on a cloth roll for cleaning the blanket cylinder of a lithographic press.

Field of the Invention

It is known in the printing trade that the blanket cylinder of a lithographic printing press must from time to time be cleaned for a variety of reasons such as occurs at the end of a press run. Thus are known in the art a variety of ways and means of accomplishing this result including automatic cleaning devices which utilize a cleaning cloth such as shown and described in United States Patent No. 4,344,361 granted August 17, 1982 entitled Automatic Blanket Cylinder Cleaner. As shown in that patent there is a cleaning cloth supply roll and a cleaning cloth take up roll. The blanket cylinder is located in between the supply roll and the take up roll. As illustrated in the 4,344,361 patent, there is an advancing means which advances the cleaning cloth from the cloth supply roll to the cloth take up roll. Preferably, the advancing means is the type wherein essentially the same amount of cloth is advanced regardless of the diameter of the remaining cloth on the cloth supply or cloth take up roll.

In accordance with automatic blanket cleaner system described in said patent, an inflatable bladder mechanism is periodically used to force the cleaning cloth into engagement with the blanket cylinder to clean the blanket cylinder in conjunction with water and/or solvent which is directed towards the cleaning cloth.

The automatic blanket cleaner as described in the foregoing patent has been a successful commercial embodiment for some time. The commercial embodiment has been used in combination with switch means for indicating to the operator when the cloth on the cloth supply roll is near completion and when the cloth supply roll is empty. For this purpose, the automatic blanket cylinder cleaner is used with a limit switch which determines or senses the diameter of the cloth on the cloth supply roll from which the length of cloth can be inferred. Thus, the determination of the diameter of cloth remaining on the roll gives an estimation of the linear length of cloth remaining on the roll. The switches or sensors are used in combination with a signal which can be visual and/or audio for the purpose of signalling to the operator then the cloth is near the end of its supply and when the supply of cloth has been depleted. Warning systems of

the type described above has been used with success even though there are some limitations as to the accuracy of such systems.

One problem with the diameter sensing type of warning system is that the amount of linear feet remaining on the cloth is inferred but is not directly measured or determined. While the linear length remaining can be roughly calculated mathematically it cannot be determined with precise accuracy because the diameter itself is not determined with the precision necessary to make a completely accurate measurement of length of cloth. In addition, the accuracy of making the diameter measurements is limited by variations in the diameter of the cardboard core, the accuracy of the bores in which the shaft is positioned in the frame and many other dimensional variations which may occur in the manufacture of the parts and elements which comprise the cloth supply and cloth take up supply mechanisms. For these reasons the use of mechanisms for inferring the length of cloth left on the cloth supply may be inaccurate by as much as a yard or even more. In the competitive cost conscious printing world a yard of cleaning cloth is significant.

In general, a cloth supply roll may consist of about twelve (12) yards of cloth which can be used for about two hundred and fifty washes for a web press or about one hundred and twenty-five washes for a sheet feed press. Depending on the circumstances an operator in an eight hour shift may have in the range of 8-15 wash ups. Thus, depending on circumstances only about two inches of cloth may be necessary for a wash up of the blanket cylinder. For this reason three feet of cloth can be used for a substantial number of washes depending on various circumstances. One of the purposes of this invention is to utilize as much cloth as possible for wash-ups and to avoid waste of cleaning cloth.

The possibility of inaccuracy in using an inferred system to determine the length of the remaining cleaning cloth can result in wasted cloth and there is a possibility that when there will be no cleaning cloth in contact with the blanket cylinder, causing severe scratching of the blanket cylinder. Thus where a bladder type system normally forces the cleaning cloth to engage the blanket system, severe scratching damage to the blanket cylinder could occur if there has been an inaccurate cloth supply length determination and the bladder engages the blanket cylinder rather than the cloth.

It will be understood that as used herein the term cloth may be defined as described in the 4,344,361 patent or could be some other type of a suitable fabric, cloth or paper material used for cleaning a blanket cylinder.

There are a number of prior art patents which relate, in general, to determining the end of some material which is being unwound from a wound core.

Patent Number 3,449,733 to Berquist relates to equipment where the material wound on the spool is magnetic or magnetizable. A recording head records information (similar to a tape recorder) in the material being processed. This information is utilized by a sensing head to determine the end of the spool and control other machine functions.

Patent Number 3,990,625 to Jelling et al., refers to automatic bagging equipment that uses prepunched holes in a plastic web to indicate the end of the bag. Sensing is accomplished via spring fingers adopted to fit within the holes. The patent also mentions the use of other types of material, such as opaque spots or the line which are sensed photo-electrically or electrocapacitively.

Patent Number 3,146,431 to Betts discloses a patch of conductive material; namely, the tear strip used on cigarette packs which is applied to the end of a web. The web is unwound through a sensor that consists of two conductive brushes which complete an electrical circuit when the conductive material contacts both brushes. This is used to indicate the end of the web to the machine operator.

Patent Number 3,184,177 to Hannah discloses holes or opaque patches or clear patches that are used on a filmstrip to accurately position the frame. Two photocells are used to sense the frame position.

Patent Number 3,542,304 to Hudson discloses two conductive rollers used to sense metallic particles embedded in a textile fabric web. This locates the particles so they can be removed before they damage the fabric.

Patent Number 3,568,584 to Harvey discloses a camera autowind mechanism which senses the film position via contacts and conductive material on the film. The conductive material is applied so that regularly spaced discontinuities occur in the conductive material. These discontinuities are then sensed. The patent also discloses holes in the film that are sensed by spring fingers that operate electrical contacts.

Patent Number 4,115,013 to Hedstrom discloses a photo-detector which is used to sense the end of a printer ribbon. Reflective material is attached to the ribbon.

Patent Number 4,212,552 to Bemis et al. discloses conductive material which is applied to a printer ribbon. Two contact fingers touch the ribbon as it is unwound to complete an electrical circuit when the conductive material touches both contacts. This provides an end of ribbon signal to the printer.

Patent Number 2,821,284 to Garwood et al. discloses a conductive tape or foil that is attached to a carbon paper web and sensed by two conductive rolls. When the foil passes between the two rollers, an electrical signal is used to activate a warning device.

With the foregoing in mind it is an object of this invention to provide a new and improved system for cleaning blanket cylinders for lithographic presses.

Another object of this invention is to provide a new and improved system for cleaning blanket systems by determining the termination of the cloth supply.

A further object of the invention is to provide a cleaning cloth for a blanket cleaning system with an indicia means on the cloth and sensing means for sensing the indicia to give an operator information relative to the cleaning cloth.

A still further object of this invention is to provide a process for warning the press operator of the termination of the cloth supply by providing a target indicia on the cloth which can be sensed so as to alert the operator that a predetermined length of cloth remains and to warn the operator of the imminent ending of the cloth supply.

Another object of this invention is to provide indicia capable of being sensed by a sensor on a cleaning cloth in an appropriate location whereby during the blanket cleaning cycle the end of the cloth supply will be indicated.

A still further object of the invention is to provide at least one indicia a predetermined distance from the end of the cleaning cloth for a blanket cylinder whereby sensor means can determine when the cloth is near its end and when the cleaning cycle should be stopped.

A still further object of this invention is to provide a sensing method combination which is particularly adapted for use in a lithographic press environment which is adapted to sense the end of a cleaning cloth supply cycle.

Additional objects and advantages of the invention will be set forth in the description which follows and, in part, will be obvious from the description, the objects and advantages being realized and obtained by means of the instrumentation, parts, methods and apparatus and procedures particularly pointed out in the appended claims.

Brief Description of Invention

Briefly described the invention herein relates to cleaning blanket cylinders of lithographic presses and comprises selecting an indicia to be applied and/or connected to a non-metallic, non-magnetic fabric type cleaning cloth material which indicia can be sensed by another element and/or mechanism

when in the appropriate vicinity. The indicia is positioned on the cleaning cloth at a predetermined location on the cloth and oriented in accordance with the information sought. The invention includes positioning and sensing the indicia selected at an appropriate location for the purpose of warning the operator of the forthcoming end of the cloth supply and/or actually ending the cleaning cycle at the end of the cloth supply.

The indicia can be in the form of metal, ferrous or non ferrous (such as aluminum foil, mercury, etc.) and/or magnetic material positioned on the non-metallic, non-magnetic cleaning cloth such as paper in any convenient manner. The indicia may be in the form of strips or stripes of paint, e.g., black stripes, positioned longitudinally or transversely of the cloth and there may be one or more such indicia. The indicia may be positioned on the cloth by an adhesive tape, weaving, painting or any other convenient manner.

Depending on the type of indicia attached to the cleaning fabric, an appropriate sensing means is provided for sensing the presence of the indicia. This sensing means may be of the type which is responsive to metal, non ferrous, magnetic fields, capacitance, light which does not necessarily require contact between the sensor and the indicia for activating the sensor.

The invention may also utilize photoelectric principles of the visible and/or infrared type. In this form the invention can utilize retroreflective sensing, diffuse infrared sensing, diffuse visible sensing and fixed focus sensing. This form of the invention requires that the indicia be of sufficient difference in light level with respect to the light level of the cloth that the sensor be able to sense a change in the amount of light received by the sensor. This form of the invention can utilize visible or infrared light.

The invention consists of the novel parts, steps, construction, arrangements and improvements shown and described.

The accompanying drawings which are incorporated in and constitute a part of this specification illustrate an embodiment of this invention and together with the description serve to explain the principles of the invention.

Of the Drawings:

Figure 1 is a perspective view of the automatic blanket cleaner of the type with which the present invention can be used.

Figure 2 is a vertical section taken along line 2-2 of Figure 1 showing the bladder not inflated, and the cleaning cloth spaced away from the blanket cylinder showing a sensing means positioned in accordance with this invention.

Figure 3 is a section similar to Figure 2 showing the bladder inflated with the cleaning cloth in engagement with the bladder cylinder.

Figure 4 is a diagrammatic view showing the relationship between the indicia and the sensor means.

Figure 5 is a view showing a plurality of spaced indicia on the fabric showing one form of the invention.

Figure 5A is another schematic view showing a plurality of indicia.

Figure 6 is a view showing an indicia on the fabric along the length of the fabric.

Figure 7 is a perspective view of a cloth roll with an aluminum strip indicate means of one form of the invention.

Figure 8 is a broken view partially in sections illustrating inductive sensor.

Figure 9 is a schematic view showing the relationship between the induction sensor and the cloth roll with indicia thereon.

Figure 10 schematically illustrates the wiring diagram.

Figure 11 shows a cloth roll of another form of the invention with a black stripe as an indicia on the fabric roll.

Figure 12 is a view partially broken away showing the mounting of another form of sensor means.

Figure 13 is a schematic view showing the relationship between the photoelectric sensor and the cloth roll with indicia thereon.

Figure 14 is a schematic illustration of a photoelectric sensor circuit.

Detailed Description Of The Drawings

Referring to Figures 1-3, there is shown therein the environment in which the present invention can be used which figures are comparable to Figures 1-3 of U.S. Patent 4,344,361. It is to be understood that the invention is not limited to use with that particular structural relationship of a blanket cleaner but is merely illustrative.

As shown in Figures 1-3, there is a blanket cylinder 2, a cloth take-up roll 4 and a cloth supply roll 6 suitably mounted on stationary side frame 8. A cleaning cloth C is fed or pulled from the cloth supply roll 6 to the cloth take-up roll 4. The purpose of the cloth C is to clean the blanket cylinder 2. For this purpose, the drawings show an inflatable bladder member 38 which is adapted to be inflated to engage the cloth C which in turn engages the blanket cylinder in a selected predetermined manner through any convenient mechanism such as described in United States Patent No. 4,344,361. It is understood that the fabric engaging means is not limited to an inflatable bladder means.

The cleaning cloth C should be uniformly absorbent to water and solvent and substantially as described in United States Patent No. 4,344,361. The cloth is preferably non-metallic and non-magnetic and adaptable to have placed in or on indicia which may be in the form of small pieces of metal, non ferrous and/or magnetic material or paint in any convenient form or shape.

Referring to Figures 1-4, there is schematically shown a sensor means 10 positioned so that the sensor 10 can sense the indicia 14 located on the cleaning fabric C. The sensor can be of the type, described subsequently, which does not require contact but is responsive to metal, non ferrous, magnetic field or capacitance, all of which are known in the art.

Figure 4 shows in schematic form the cloth roll 4 with an indicia means on the cloth C, specific embodiments of which are described later, and a sensor(s) on a support member adapted to sense the indicia means.

Referring to the Figure 5, there is shown the end of a roll of cleaning cloth C of the type described with an indicia 20 thereon a predetermined distance from the end of the cloth. The indicia may be a portion of magnetic tape, metallic, non ferrous and/or magnetic tape or metallic paint, the presence of which is capable of being sensed by commercially available sensors such as inductive, capacitive, electromagnetic, photoelectric.

For example, the indicia on the cloth may be metallic, non ferrous and in the form of a metal tape, non ferrous tape, electroconductive paints, a metal paint or some other type of metal member which can be applied or attached to the cloth of the fabric cloth supply in any convenient manner. In other embodiments this indicia could be black or other dark paint.

For example, the indicia may be attached to the fabric by an adhesive, by tape threads, by weaving or any other convenient manner.

As shown in Figure 5A, there can be one or more indicia on the cloth depending on the desired sequence of operations. For example, there could be a first target indicia 22 which is for the purpose of warning the operator that the end of the cloth is near and a second target indicia 26 which alerts the operator that the cloth supply has ended and the cleaning cycle must be ended in order to avoid scratching.

For convenience as shown in Figure 5A, a plurality of target indicia for each predetermined position are shown. This is one form of the invention which does require the operator to know the exact location of the target indicia on the cloth. If desired, a single target indicia can be used for each predetermined location provided it is known that such target indicia can be aligned with the

sensor means.

As is well known in the art, the signals could be visual or audio or both as desired.

The target indicia can be positioned on the cloth a first and a second predetermined distance from the end of the cloth. The first predetermined distance can be determined by the length of cloth required for each wash multiplied by number of washes which the operator desires to be aware of before the end of the cleaning cloth. The second predetermined distance can be whatever distance the operator requires to stop the wash-up cleaning operation in sufficient time to prevent potential injury to the blanket cylinder.

Referring to Figure 6, another form of the invention is illustrated. In this form of the invention there is a single indicia target stripe or strip is utilized which runs along the length of the cleaning cloth.

As embodied, the target indicia 24 has a leading end 28 and a trailing end 30. In this embodiment, the target indicia is such that the leading end 28 is at the first predetermined position for the purpose of signaling the beginning of the end of the cleaning cloth whereas the trailing end 30 signals the actual end of the cleaning cloth. It will be appreciated that when the leading edge is sensed by the sensor means, which may be of the same type as in Figure 5, it activates a warning signal which warning signal which signals terminates when the trailing edge 30 is sensed by the sensor.

It will be appreciated that with this invention, the first target indicia signals the operator that there is only a predetermined length of cleaning cloth left on the cloth supply roll. This can be done, e.g. by coating the pulser of the cylinder. This enables the operator to know that only a certain amount of cloth is left for cleaning purposes and he can plan his work shift accordingly. On the other hand, with the second target indicia another warning signal will occur when the cleaning cloth is at its end so that the operator will not permit the blanket cylinder to go through with the cleaning cycle which could cause damage such a scratching of the blanket cylinder.

As noted earlier, the target indicia may be metal, non ferrous, electroconductive paints and/or metallic or non-metallic dark paint. Where a metallic indicator is used, it can be used with any convenient commercially available micro switch, such as PK 87592 available from the Honeywell Division. Such a micro switch may be a proximal sensor activated by a ferrous metal of appropriate thickness or even a non-ferrous metal foil having a thickness in the range of 0.0005 to 0.002 inches. With such a proximal sensor, actual contact is not needed and it detects moving targets without physical contact or magnetic attraction between sensor

and target 4.

With this type of target and sensor, an electromagnetic field is generated by a coil in the sensor face. When this field is absorbed by an indicia target, Eddy currents are generated. This presents a reflected load to the sensor's oscillator, thus reducing its signal level. This change in signal level is amplified by the integrator circuitry which drives a Schmitt trigger. The trigger signal is coupled to an output transistor which provides the digital output.

In another form of the invention a magnetic indicia or target is provided for which a sensor responsive to magnetic forces is required. For this purpose there is commercially available a 400SR Sensor from the Honeywell Division. This is a low cost solid state Hall effect sensor which is magnetically operated by the 6 to 16 VDC supply.

There are numerous other types of indicia which may be considered in practice of the invention. These include:

Magnetic Inks. Magnetic inks are magnetically charged and display relatively low flux for a short time. They are for light offset and water press form and must be heat set before use.

Electro Conductive Inks. These inks have a high ohm resistance but the conductivity may be deactivated and the ink may come off if there is contact with water and/or moisture.

Electro Conductive Paints. These paints have great conductivity characteristics and are cost effective. However, inductive sensors are not capable of detecting these conductive paints due to their lack of high ferrous content. In addition, such paints require air/heat to dry on application.

Conductive Graphite Resistant Coatings. Such materials have high conductive characteristics and come in a gel like form and must be diluted in deionized water and mixed.

Capacitive Sensors. The cloth has a low dielectric constant and detection is very difficult.

Capacitive Proximity Sensors. In this situation, a sensor is used to sense dielectric materials, metals, conductive materials, rubber, glass, and sensing depends on the dielectric constant. These sensors tend to be large in size and the sensing distance is based on the size of the sensing head.

Inductive Proximity Sensor. Thus, a preferred embodiment of the inductive proximity sensor form of the invention illustrating the invention is shown in Figures 7-10.

Figure 7 shows the cloth roll with inductive type indicia thereon.

As is known in the art, the inductive type sensor functions as shown schematically in Figure 10.

Figure 10 illustrates in schematic form, an inductive proximity sensor 29 consisting of a coil 30

and ferrite core 32, an oscillator 34 and detector 36 circuit and a solid state output 38. The function of the oscillator 32 is to create a high frequency field radiating from the coil in front of the sensor which is centered around the axis of the coil 30. The ferrite core bundles and directs the electromagnetic field to the front.

The sensor 29 is positioned within an aperture 35 (Figures 8-9) in a support member 37 in any convenient manner. As shown in Figure 9, the sensor is positioned so as to detect the warning strip indicia 22 and the end of strip indicia or target 24.

The indicia is preferably aluminum foil (31), but it may also be stainless steel, mercury, lead, brass or copper. In operation, when the indicia on the fabric enters the high-frequency field, eddy currents are caused to be induced in the surface of the indicia. This causes a loss of energy in the oscillator circuit and a smaller amplitude of oscillation. This change in amplitude generates a signal until the indicia leaves the sensing area and the sensor returns to its normal state.

As noted, the preferred indicia material is aluminum foil having a thickness of about .002 inches. The distance between the aluminum foil and the sensor is approximately .250 inches maximum and there is accurate detection if within the sensing distance of .250 maximum. It is desirable that the cloth be kept in a taut condition for reliable results. This form of the invention is not adversely affected by air borne dust or other contaminants.

Another form of the invention involves the principle of photoelectric sensing wherein light energy travels through space in a concentrated form i.e. photons. The photons strike a surface in the application referred to as an indicia to liberate photoelectrons. The energy of the photoelectrons can be used to create an electric current in a manner understood in the art. The electric current can be used to activate a light or other visible or audible alarm.

Generally speaking, optical systems of any photoelectric sensor is for one of three basic sensing modes which can be used with visible or infrared light. These are classified as opposed, retro-reflective or proximity. The photoelectric proximity mode is further sub-classified as diffuse proximity, divergent-beam proximity, convergent-beam proximity, and background suspension proximity.

Retroreflective Sensing. In this form the indicia is a reflective target on the cloth roll and the detector detects reflective surfaces on tape. The reflective indicia target returns light along the same optical axis. It is desirable that the reflective distance not exceed .6 inches over the minimum requirement.

Diffuse Infrared Sensing A proposed preferred embodiment of the invention illustrated in Figures 11-14, uses diffuse infrared sensing where the sensor detects a black flat paint stripe 40 on the cloth roll. The black stripe is in the range of about $\frac{1}{2}$ to 1 inch in width, preferably one inch in width. In use, the infrared light strikes the indicia's surface and light is scattered by the surface at all angles with a small portion of the light is reflected back along the optical axis. The sensing distance in the preferred embodiment is approximately .80 inches. The detection of the black stripe against the light colored fabric background depends on the density of the stripe and should be relatively dense for accurate detection since it requires a relatively large contrast differential to perform satisfactorily in an atmospheric area contaminated with dust, debris, etc. It is preferred that the density specification be about 1.14 as measured in a standard density manner. The density range measurement may be about .9 to 1.5 on the density measuring instrument.

Figure 11 shows in schematic perspective a painted black stripe 40 on a cloth roll. There are two such stripes as shown in Figure 13. Figure 13 shows a sensor in relation to the cloth roll and indicia.

In a preferred embodiment, a low-profile diffuse proximity sensor Model No. 05-Q08-AN7-V11131 of Banner Engineering Corp. of Minneapolis, MN was utilized. The sensor in the appropriate operating mode which is the "dark on" operation which conducts when the sensor does not use the reflection of its own modulated light from the cloth because the dark indicia is in the path.

The Banner Q08 series sensor low-profile infrared sensor diffuse proximity sensor with a metal housing is shown mounted in a frame member 46 by a screw means 48 (Figures 12-13) on an aperture in what is shown as an L shaped support member adjacent the feed cloth roll. As shown in Figure 13, the feed cloth roll has two black stripes of the type described above, one of which is a warning stripe, and the other being an end of cloth stripe.

As will be understood, the sensor is activated when the black stripes are within the sensor range to sound and/or display an appropriate alarm.

Referring to schematic Figure 14, there is shown a conventional photoelectric arrangement capable of generating a signal and/or alarm. Thus, the cloth fabric C has a indicia such as a black stripe 22 painted therein. Light is provided by any convenient source and a photoconductor 50 positioned to receive the light reflected light. As shown by the dash lines, the difference in light generates an electric signal which goes to a comparator 52 having a reference threshold which can cause an alarm 54 of any form, visual or audible to be

activated.

Diffuse Visible Sensing. Another embodiment of the invention utilizes diffuse visible sensing where the sensor is used to detect black paint stripes on the cloth roll.

In this instance, with the same physical arrangement as Figures 11-14, visible light strikes the surface of the black paint. The light is scattered by the surface and all angles and a small portion of the light is reflected back along the optical axis. In this instance, the sensing distance is .6 to .8 inches without a dust or debris on the lens or about .5 inches sensing distance with a corn starch or other debris on the lens. The detection of the black stripe on the cloth roll can be detected even if the black stripe is not dense because the contract recognition between black and white is very high and the sensor can distinguish between light and heavy paint stripes. In this instance, the stripe is between $\frac{1}{4}$ and 1 inch wide.

Fixed Focus Sensing. In this embodiment, there is a fixed focus convergent beam sensing and the light beam and sensing area is focused at a fixed distance in front of the sensing control. The power is thereby concentrated in one area for increased reliability and accuracy. The color contrast is high and the sensor can distinguish between light and heavy paint stripes. This form uses visible light rather than infrared light.

Claims

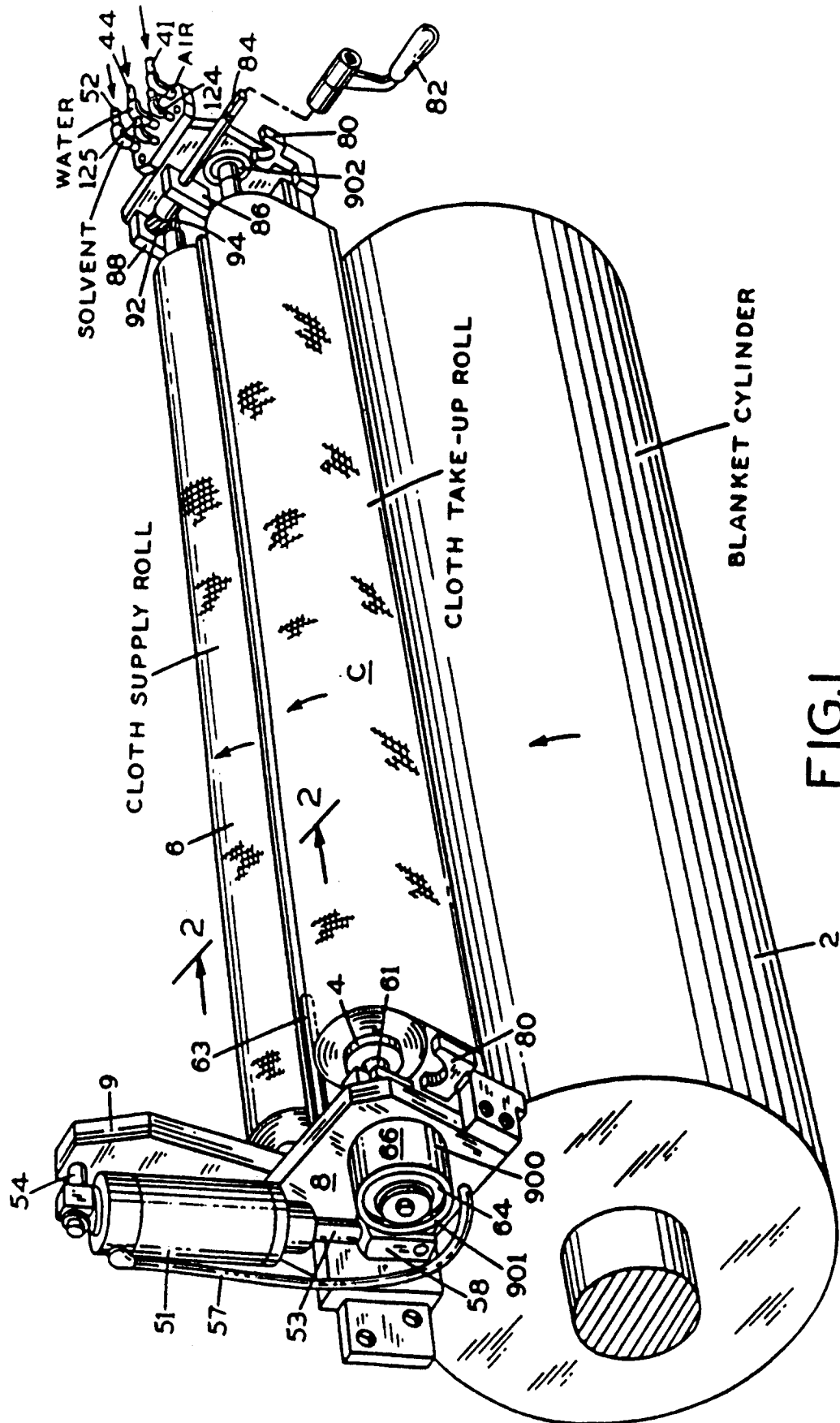
1. A method for determining the end of a cleaning cloth fabric for use in cleaning the blanket cylinder of a lithographic press of the type wherein the cleaning cloth advanced from a cloth supply roll to a cloth take-up roll and wherein the cleaning cloth fabric adapted to be in engagement with the blanket cylinder positioned between the cloth take-up roll and cloth supply roll comprising:
 - (a) providing a non-metallic, non-magnetic fabric cloth which is absorbent to both water and solvent;
 - (b) providing on said fabric at least one target indicia of the type capable of being sensed by sensor means said target being at at least one predetermined position on said cleaning cloth;
 - (c) providing a sensor means responsive to said target indicia and capable of signalling a response of said sensor to said target indicia whereby a signal is generated when said sensor responds to said target indicia at the predetermined position.
2. A method as defined in Claim 1 wherein said target indicia is positioned a first predeter-

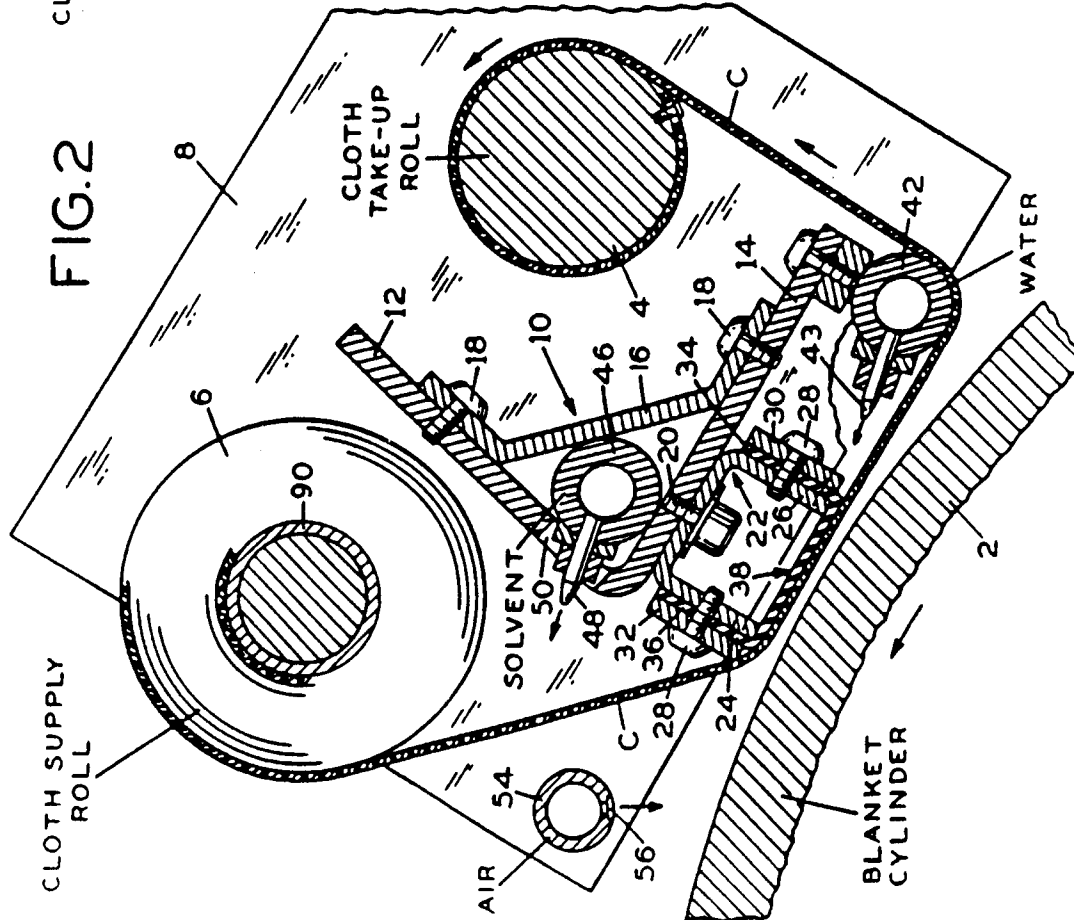
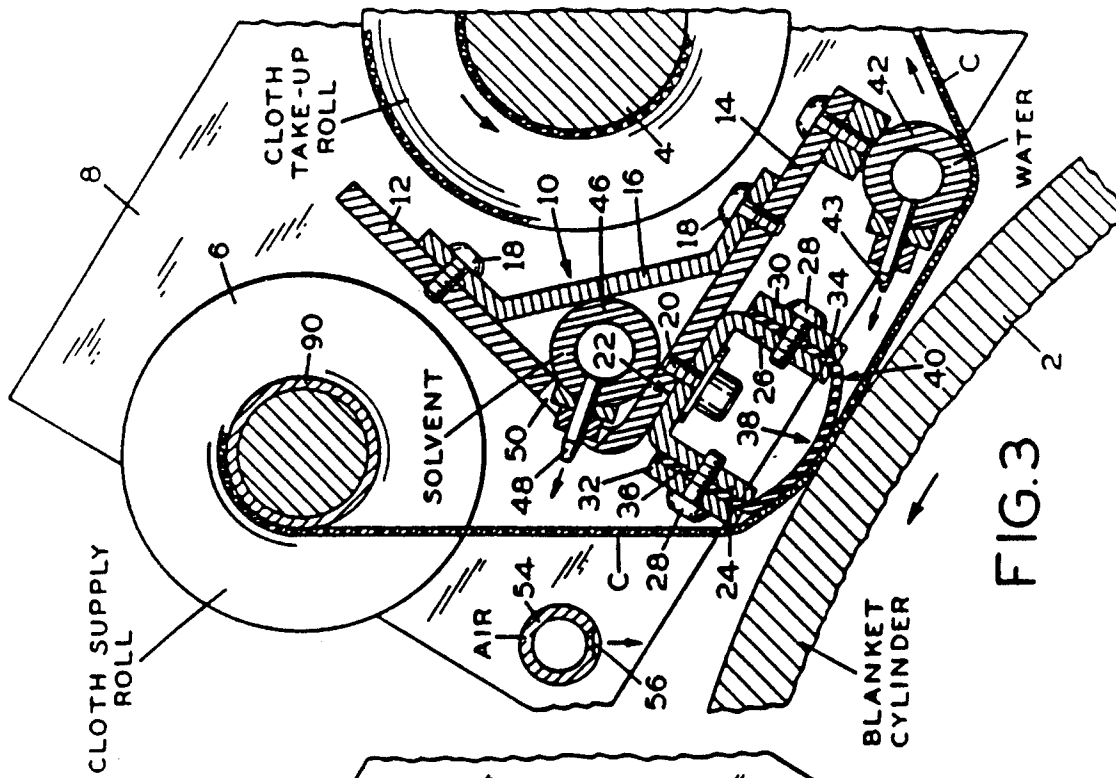
- mined distance from the end of the cleaning fabric and at a second predetermined distance immediately adjacent the terminal end of the cleaning cloth whereby the sensor senses the target indicia at the first predetermined distance from the end of the cleaning cloth to signal the beginning of the end of said cloth and again at such second predetermined distance immediately before the terminal end of the cloth.
3. A method as defined in Claim 2 wherein said first predetermined distance is determined by the length of cloth needed for a predetermined number of washes.
 4. A method as defined in Claim 3 wherein the second predetermined distance is adjacent the end of the cloth.
 5. A method as defined in Claim 3 having a plurality of target indicia.
 6. A method as defined in Claim 5 having a single target indicia consisting of a strip.
 7. A method as defined in Claim 6 wherein the target indicia is metallic material.
 8. A method as defined in Claim 7 wherein the target indicia is metallic paint.
 9. A method as defined in Claim 8 wherein the target indicia is made of magnetic material.
 10. A method as defined in Claim 9 wherein the target indicia is made of magnetic paint material.
 11. A method as defined in Claim 2 wherein the indicia is made of non ferrous material.
 12. A method as defined in Claim 2 wherein the indicia is made of electroconductive paint.
 13. A method as defined in Claim 2 wherein the indicia is a dark color stripe on cloth.
 14. A blanket cleaner device for determining the end of a cleaning cloth fabric for use in cleaning the blanket cylinder of a lithographic press of the type wherein the cleaning cloth advanced from a cloth supply roll to a cloth take-up roll and wherein the cleaning cloth fabric adapted to be in engagement with the blanket cylinder positioned between the cloth take-up roll and cloth supply roll of the type having a non-metallic, non-magnetic fabric cloth which is absorbent to both water and solvent comprising:
 - (a) at least one indicia means positioned on said fabric capable of being sensed by sensor means;
 - (b) sensor means positioned so as to be capable of response to said indicia means as the cloth roll is taken up by the cloth take-up roll;
 - (c) said sensor means responsive to said target indicia and capable of signalling a response of said sensor to said target indicia whereby a signal is generated when said sensor responds to said target indicia at the predetermined position.
 15. A device as defined in Claim 14 wherein said target indicia is positioned on the cloth fabric a first predetermined distance from the end of the cleaning fabric and at a second predetermined distance immediately adjacent the terminal end of the cleaning cloth whereby the sensor senses the target indicia at the first predetermined distance from the end of the cleaning cloth to signal the beginning of the end of said cloth and again at such second predetermined distance immediately before the terminal end of the cloth.
 16. A device as defined in Claim 15 wherein said first indicia first predetermined distance is determined by the length of cloth needed for a predetermined number of washes.
 17. A device as defined in Claim 16 wherein the second predetermined distance is adjacent the end of the cloth.
 18. A device as defined in Claim 17 having a plurality of target indicia.
 19. A device as defined in Claim 18 having a single target indicia consisting of a strip.
 20. A device as defined in Claim 18 wherein the target indicia is metallic material.
 21. A device as defined in Claim 20 wherein the target indicia is metallic paint.
 22. A device as defined in Claim 21 wherein the target indicia is made of magnetic material.
 23. A device as defined in Claim 22 wherein the target indicia is made of magnetic paint material.

24. A device as defined in Claim 15 wherein the indicia is made of non ferrous material.
25. A device as defined in Claim 15 wherein the indicia is made of electroconductive paint. 5
26. A device as defined in Claim 15 wherein the indicia is a color stripe on cloth.
27. A blanket cleaner device having a cleaning cloth take-up roll, comprising: 10
 (a) a non-metallic, non-magnetic cleaning cloth;
 (b) at least one indicia on the cloth in a predetermined position, which has a substantially different color than the fabric; 15
 (c) a diffuse infrared sensing device positioned on the blanket cleaner device in a position to sense the indicia on the fabric;
 (d) and means for signaling when the said sensor senses the difference between the fabric and indicia and creates an electrical current. 20
28. A device as defined in Claim 27 wherein said indicia are stripes of black paint and said sensor is a diffuse infrared sensor. 25
29. A device as defined in Claim 27 where said indicia is black paint and said sensor is of the diffuse visible sensing type. 30
30. A blanket cleaner device having a cleaning cloth take-up roll comprising: 35
 (a) a non-metallic; non-magnetic cleaning cloth;
 (b) at least one indicia on the cloth in a predetermined position, which has a substantially different color than the fabric;
 (c) a photoelectric sensing device positioned in the blanket cleaner device in a position to sense the indicia on the fabric; 40
 (d) and means for signalling when the sensor means senses a difference between the fabric and the indicia and creates an electrical current. 45

50

55





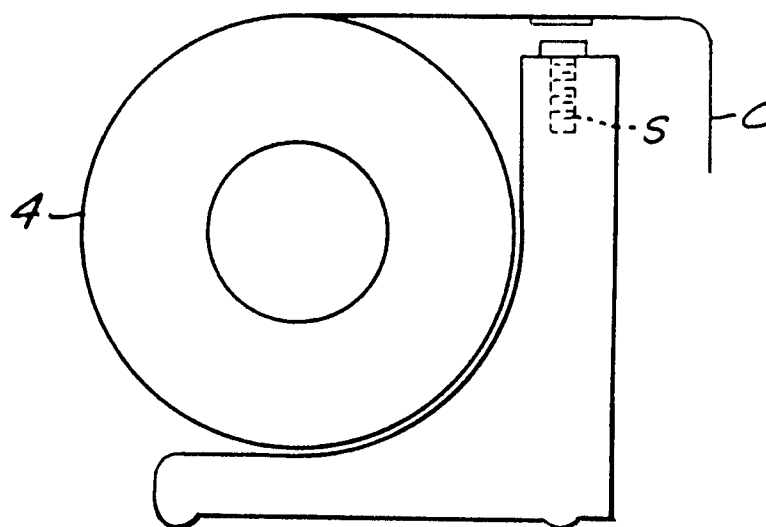


FIG. 4

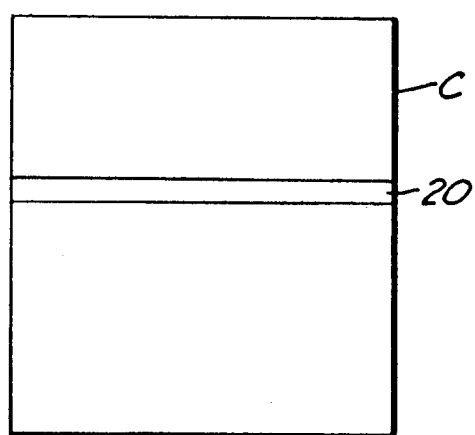


FIG. 5

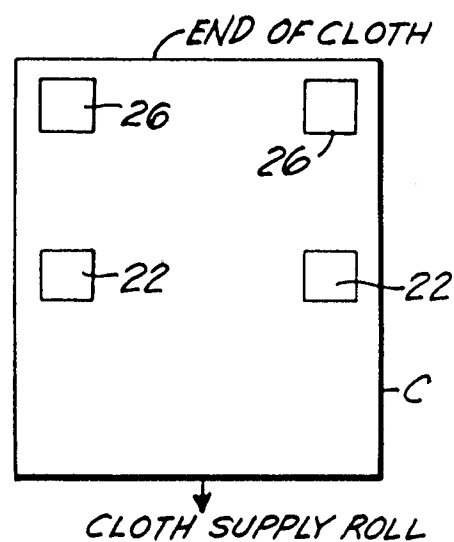


FIG. 5A

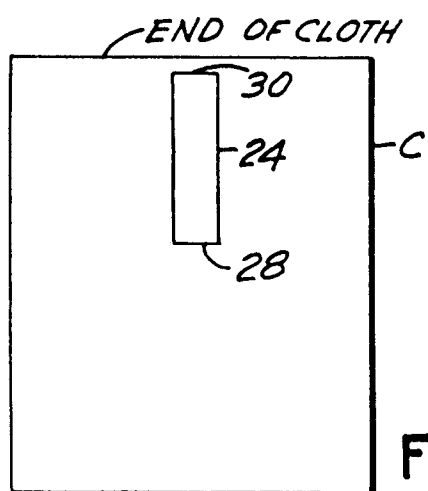
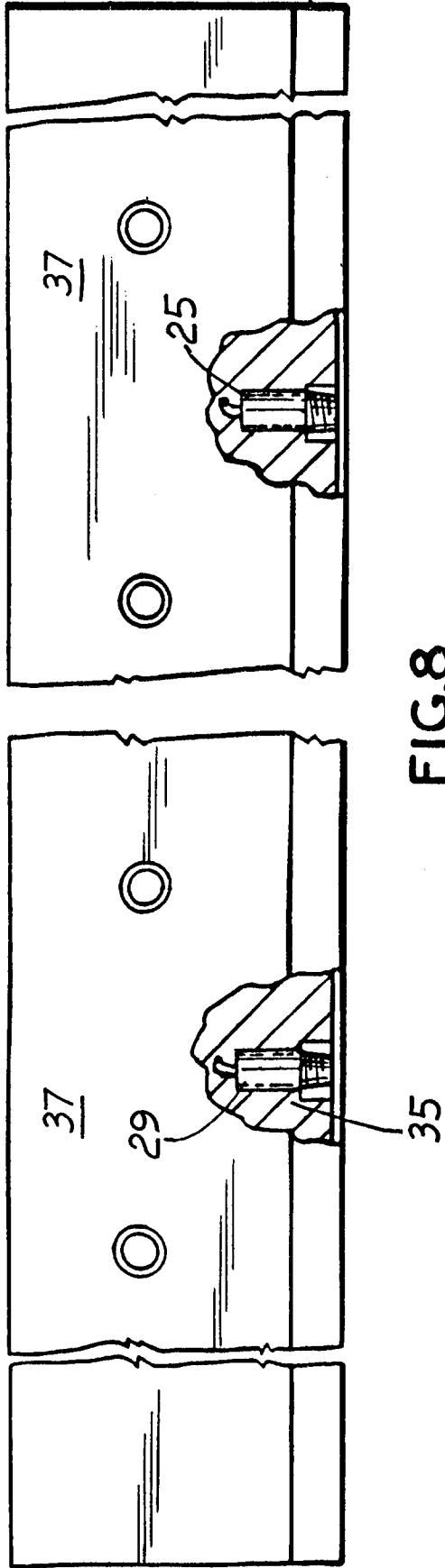
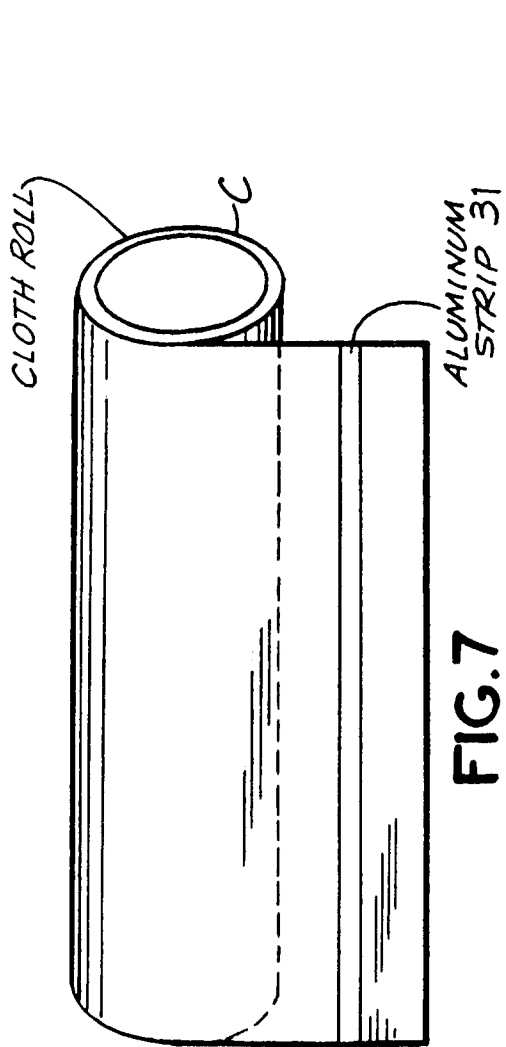
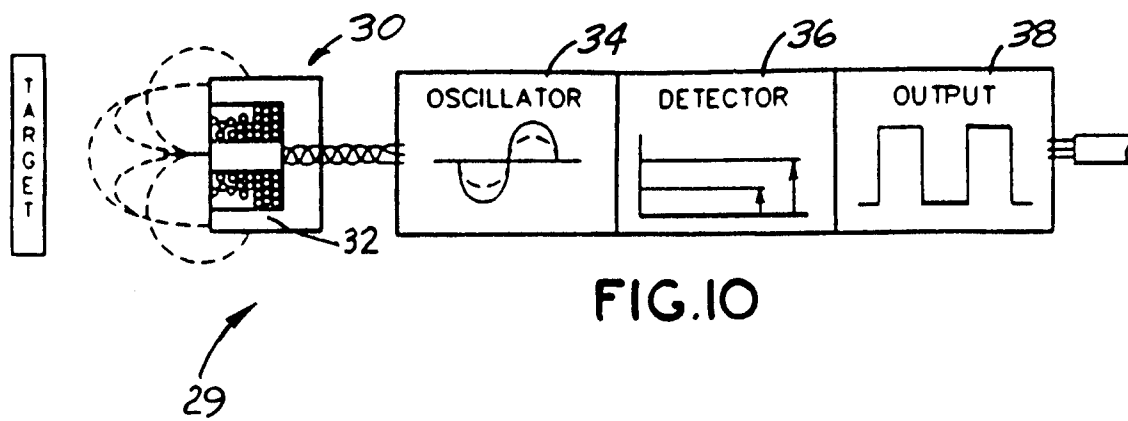
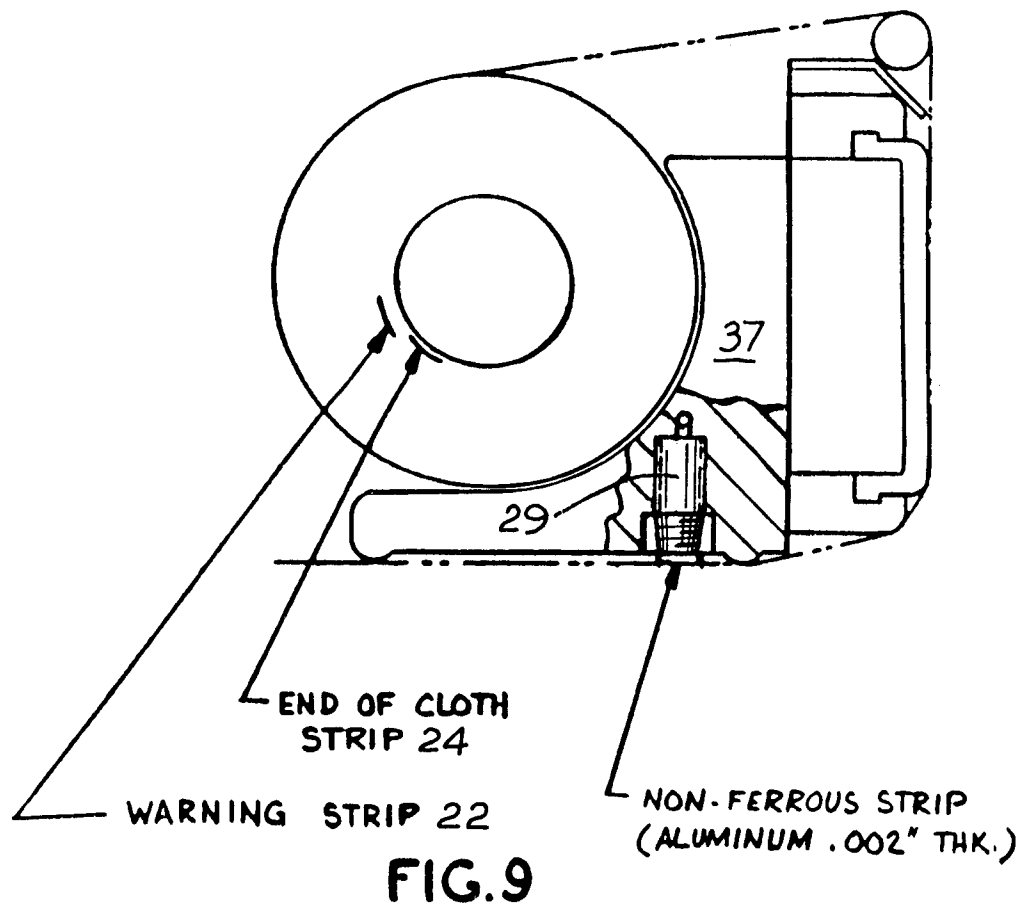


FIG. 6





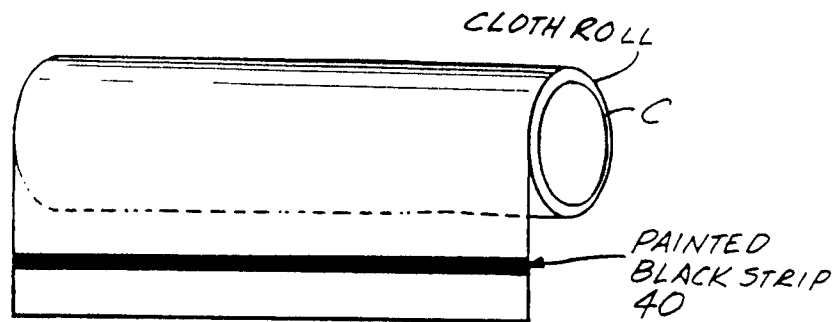
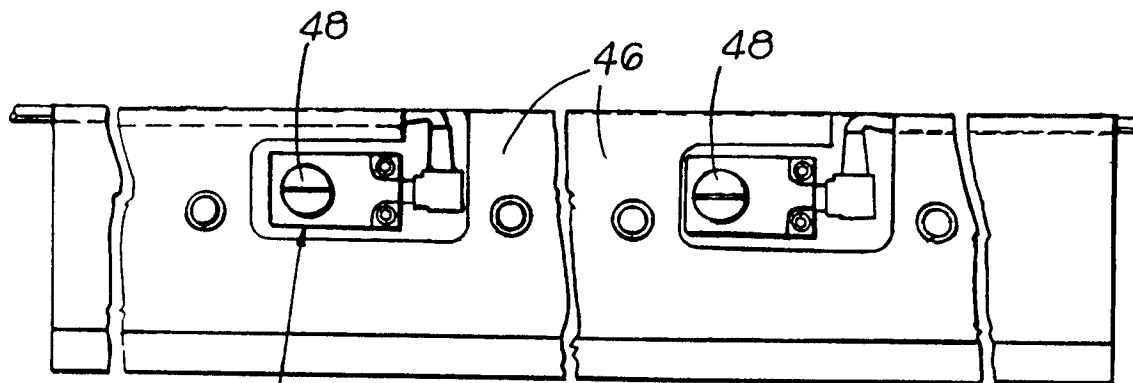


FIG. 11



BANNER QOB SERIES
SENSOR LOW-PROFILE
INFLATED DEFFUSE PROXIMITY
SENSOR WITH
METAL HOUSING

FIG. 12

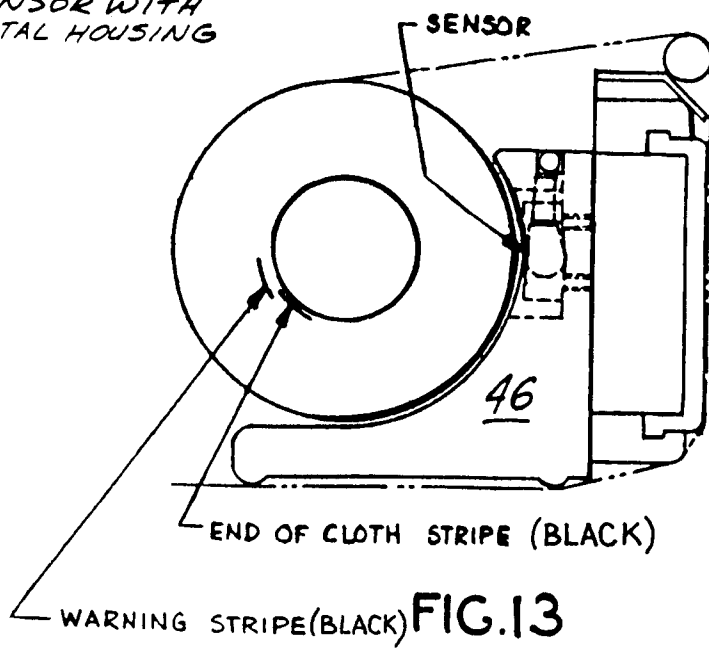


FIG. 13

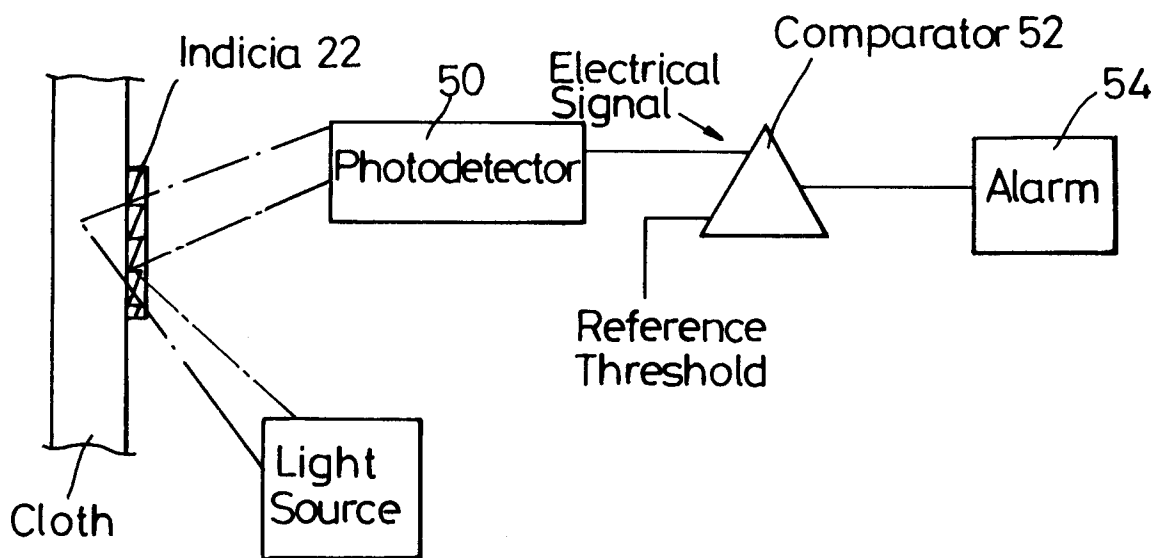


FIG.14



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 30 4298

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
D,Y	US-A-4 344 361 (MACPHEE; GASPARRINI; ARNOLDS) * the whole document * ---	1-30	B41F35/06 B65H26/00
Y	FR-A-2 595 985 (EQUIPEMENT INDUSTRIEL NORMAND) * the whole document * ---	1-30	
A	PATENT ABSTRACTS OF JAPAN vol. 9, no. 128 (M-384)(1851) 4 June 1985 & JP-A-60 12 449 (KIYUEI INSATSU KIKAI ZAIRIYOU K. K.) * abstract * ---	1-30	
A	PATENT ABSTRACTS OF JAPAN vol. 7, no. 98 (M-210)(1243) 26 April 1983 & JP-A-56 117 050 (TOKYO SHIBAURA DENKI K. K.) * abstract * ---	1-30	
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D,A	US-A-4 115 013 (HEDSTROM) * abstract * -----	1-30	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 01 DECEMBER 1992	Examiner MADSEN P.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document			