

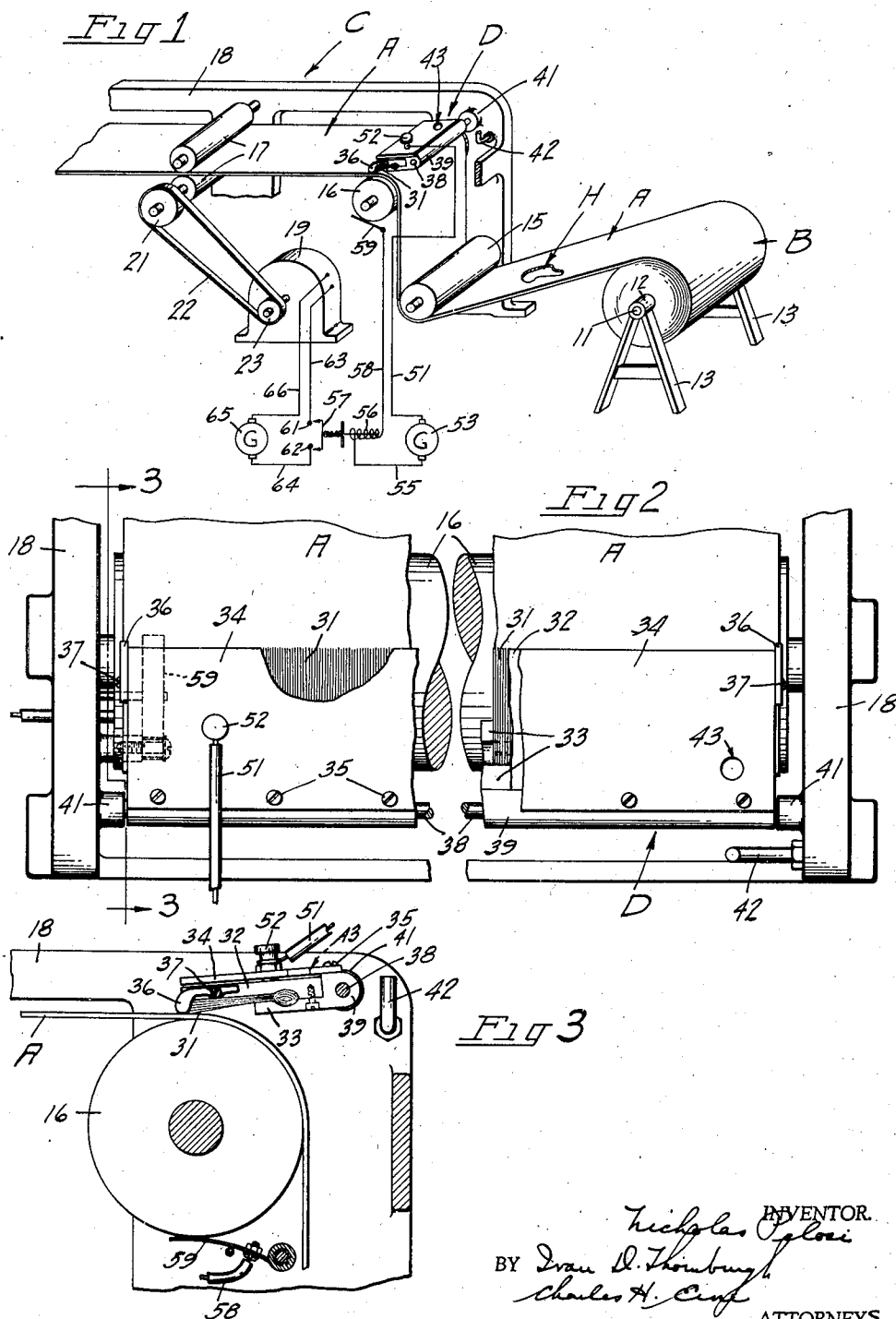
May 14, 1940.

N. PELOSI

2,200,293

CONTROL MECHANISM

Filed Dec. 30, 1937



INVENTOR.
Nicholas Pelosi
 BY *Irvin D. Thompson*
Charles H. Clegg
 ATTORNEYS

UNITED STATES PATENT OFFICE

2,200,293

CONTROL MECHANISM

Nicholas Pelosi, Newark, N. J., assignor to American Can Company, New York, N. Y., a corporation of New Jersey

Application December 30, 1937, Serial No. 182,637

7 Claims. (Cl. 192—127)

The present invention relates to a machine control mechanism and has particular reference to detecting adverse conditions in an advancing web of material to the end that the web may be without imperfections and in proper position for use.

In the manufacture of various articles, including containers or cans made from fibrous material it has been found expedient to produce such articles from a continuous web of material which may be supplied from a roll or the like. The web is preferably fed into a machine which partially or wholly produces the article. The web, in being fed, sometimes breaks and this may produce a tangle which aside from loss of stock may also damage the machine. Also the web may contain an opening such as a hole or other imperfection which if allowed to go through the machine will result in imperfect and damaged work. At other times the web in being fed into the machine may shift or run off at an angle or its travel may be uneven, irregular or erratic. Such travel is commonly known as "weaving", and this again will result in imperfect work.

The present invention contemplates the detection of adverse conditions of an advancing web which includes anything not properly found in the web at a given time and when such a condition is detected provision is made for preventing the condition doing damage.

Such difficulties may be of improper feeding, of improper position, or of torn or imperfect surface or other property in the web of fibrous material and when so detected feeding of the web is terminated until a break is repaired, or the portion of the web containing a hole is removed, or until the web is realigned to prevent its "weaving".

An object, therefore, of the invention is the provision, for a moving web of fibrous material or the like, of electric detecting and machine line control mechanism which will detect breaks and holes in the moving web and which, at the same time, will prevent "weaving" of the web so that the undesirable effects of such difficulties will be prevented.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawing, discloses a preferred embodiment thereof.

Referring to the drawing:

Figure 1 is a schematic perspective view of a web feeding apparatus including detecting mechanism embodying the instant invention and show-

ing a web being fed along a predetermined path of travel from a supply roll, parts being broken away, the view also including a wiring diagram which is associated with the detecting mechanism;

Fig. 2 is an enlarged fragmentary top plan view of a portion of the feeding apparatus and of the detecting mechanism; and

Fig. 3 is a sectional view taken longitudinally of the travel of the web, this being substantially along the broken line 3—3 in Fig. 2.

As a preferred embodiment of the instant invention the drawing illustrates a web of fibrous material A being advanced from a supply roll B through a feeding apparatus C, which includes a web detecting and control mechanism D. The web of fibrous material may be paper or the like from which containers or other fibrous articles of manufacture are produced.

The supply roll B of the fibrous material is preferably supported in a horizontal position on a shaft 11 (Fig. 1) carried in bearings 12 formed in a pair of sub-frames 13. Web A is threaded through the feeding apparatus C preferably passing under an idler roller 15 then over a metal detector roller 16 and hence between a pair of feed rollers 17. These rollers are mounted on shafts journaled in suitable bearings formed in a main frame 18.

The feed rollers 17 are rotated in unison by any suitable means such as an electric motor 19. For this purpose one of the shafts of the feed rollers 17 is provided with a pulley 21 which is driven by an endless belt 22 taking over a drive pulley 23 on the shaft of the motor 19. Rotation of the feed rollers 17 by the motor thus draws the web A through the apparatus as it unrolls from the roll B and also advances it to any suitable machine for further treatment.

The detector and control mechanism D is located adjacent the detector roller 16. This mechanism preferably includes a fine bristle, copper wire, brush 31 which is clamped between a metal top plate 32 and a bottom plate 33. The top plate 32 extends the full length and width of the brush and the bottom plate 33 also extends the full length of the brush but only sufficient of its width to hold the brush in place.

The top plate 32 is protected by an overlying insulating plate 34 which is secured in place by screws 35. A clip or finger 36 is secured by a pivot screw 37 to each end of the top plate 32. These two clips rest of their own weight on the extreme edges of the web A as shown in Fig. 2 as the web moves over the detector roller 16.

The brush unit just described is supported in a substantially horizontal position on a pivot rod 38 which is disposed in a bearing 39 formed in the bottom plate 33. The ends of the pivot rod are carried in bearings 41 which are formed in the main frame 18. The brush 31 normally rests on top of the web A as the latter passes over the detector roller 16 but may be swung out of the way when desired by lifting the free end of and by rotating the brush unit on the pivot rod 38. When in non-operating position the brush unit may be supported on an L-shaped pin 42 which is secured in the main frame 18. The pin extends through a hole 43 in the insulating plate 34 and contacts directly with the metal top plate 32 of the unit.

The brush unit controls the operation of the electric motor 19. This is effected by electric apparatus including a detector electric circuit and a motor circuit which are shown in the wiring diagram in Fig. 1 and which are interposed between the brush unit and the motor.

The detector circuit includes a wire 51 one end of which is connected to a terminal 52 which is secured in the top plate 32 of the brush unit. The other end of the wire 51 is connected to a source of electric energy such as, for example, a generator 53. The generator is also connected by a wire 55 to a solenoid 56 which is part of a relay switch 57. The solenoid in turn is connected by a wire 58 to a spring brush 59 which is secured to the main frame 18 and which is held in frictional contact with the metal detector roller 16. The circuit is thus grounded on the machine frame 18.

The motor circuit includes the relay switch 57 and comprises besides this switch, a pair of switch terminals 61, 62 which are normally engaged by the switch points. The switch is thus normally closed. Terminal 61 is connected by a wire 63 to the motor 19. Terminal 62 is connected by a wire 64 to a source of electric energy such as an auxiliary generator 65. The auxiliary generator is also connected by a wire 66 to the motor. When the motor circuit is closed this being under normal operating conditions, as when the relay switch is closed, electrical energy flows from the auxiliary generator 65 to the motor 19. Operation of the motor, as hereinbefore explained, rotates the feeding rollers 17 and this feeds the web A of material through the apparatus.

When there is a break or a hole (indicated in Fig. 1 by the letter H) in the moving web A this is detected as it passes over the detector roller 16. At that time more or less of the bristles of the brush 31 extend through the break or the hole and directly contact the detector roller 16. This contact immediately establishes and closes the detector circuit and electric energy from the generator 53 energizes the solenoid 56.

When the solenoid is energized its sliding core opens the relay switch 57 and thereby breaks the motor circuit at the contacts 61 and 62. Thus the motor stops operating and feeding of the web A is terminated. Not until the break in the web is repaired or the portion of the web containing the hole is cut out and the web again pieced together to provide a continuous surface can the motor be again started.

When "weaving" of the web A causes one of the clips 36 to ride off the edge of the web A it contacts the detector roller 16. This establishes the detector circuit, in the same manner as just explained for a break or a hole in the web, and

the solenoid 56 being energized the motor circuit is broken and stopping of the motor results.

When the web has been realigned on the roller and the clips replaced on top of the web the detector circuit will be broken at the web. The web A serves as insulation on the detector roller 16 as long as the clips 36 or the brush 31 remain on the web and are held away from and out of contact with the roller. The motor circuit can then be re-established so that feeding of the web will be resumed.

Provision is also made for preventing normal feeding of the web A when the brush unit is in non-operating position as when laid back on the L-shaped pin 42. When in this position the pin 42 directly contacts the top plate 32 of the brush unit and this completes the detector circuit between brush and detector roller through the medium of the main frame 18. Establishment of the detector circuit in this manner accomplishes the same result as when completed during "weaving" or breaking of the web.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A control mechanism for a machine operating on a web of insulating material fed therethrough, comprising in combination: feeding means including an electric motor for advancing the web through the machine, a metal detector roller over which said web passes, a flexible metallic brush pivotally mounted above said metal roller and normally held separated and insulated therefrom by said web, said metallic brush being adapted to make electrical connection with said detector roller when an opening in said web breaks the insulation by allowing engagement between brush and roller, such electric connection stopping said motor and travel of said web.

2. A control mechanism for a machine operating on a web of material as it is fed therethrough, comprising in combination feeding means including an electric motor for advancing the web through the machine, a metal detector roller over which said web passes, a flexible brush member pivotally mounted above said detector roller and normally held separated therefrom by said web, said brush member substantially extending across the entire width of said web, an electric motor circuit for said motor, a normally open electric detector circuit including said detector roller and said brush member, and a relay switch common to both circuits and normally holding said motor circuit closed, said flexible brush member closing the detector circuit and energizing said relay switch to break the motor circuit and stop feeding of the web when an imperfection in the web passes over the roller and allows said brush member to contact the detector roller.

3. A control mechanism for a machine operating on a web of material fed therethrough, comprising in combination, feeding means including a detector roller for advancing the web through the machine, and detector devices electrically connected with said web feeding means, said detector devices including a pivotally mounted flexible metallic brush member nor-

5 mally maintained by said web out of contact with
said roller, said member operating to contact said
roller to stop actuation of said web feeding means
when said devices detect imperfection of condi-
10 tion of the web of material and its position on
and relative to said roller.

4. A control mechanism for a machine oper-
ating on a web of material fed therethrough, com-
prising in combination, feeding means including
a detector roller for advancing the web through
15 the machine, and detector devices electrically
connected with said web feeding means and
adaptable to press against said web during nor-
mal feeding thereof but being movable into de-
tecting position when not properly held by said
20 web, said detector devices including independent
pivotally mounted flexible metallic brush mem-
bers normally maintained by said web out of
contact with said roller, said members operating
to contact said roller and energize an electric
circuit to stop said web feeding means when said
web is defective or out of position relative to
said detector roller.

5. A control mechanism for a machine oper-
25 ating on a web of material being fed there-
through, comprising in combination feeding
means including an electric motor for advancing
the web through the machine, electric detector
devices including a detector roller arranged as
30 a part of an electrical circuit and disposed ad-
jacent the path of travel of said web, said de-
tector devices further including a pivotally
mounted flexible metallic brush member mov-
able into and out of detecting position, said brush
35 member being movable by gravity into detecting
position against said roller when continuity of
the web is interrupted, and operating through
said electrical circuit to stop actuation of said
40 motor, a supporting unit arranged to support said
brush member out of operating position, and an
additional electrical circuit connecting said de-
tector devices and said supporting unit with said
motor, said supporting unit operating through

said last mentioned electrical circuit to stop actu-
ation of said motor when said brush member is in
non-operating position on said supporting unit.

6. A control mechanism for a machine oper-
ating on a web of material fed therethrough, 5
comprising in combination feeding means in-
cluding an electric motor for advancing the web
through the machine, a metal detector roller over
which said web passes, a finger and a flexible
10 metallic brush member pivotally mounted above
and adjacent each longitudinal edge of the web
where it passes over said roller, said fingers being
normally separated from the roller by engaging
on the moving web, and electric circuits con-
15 necting said fingers with said electric motor, said
fingers and said brush member operating through
said electric circuits to stop said feeding means
upon engaging said roller when the web "weaves"
on the roller and moves out of separating posi-
20 tion.

7. A control mechanism for a machine oper-
ating on a web of material as it is fed there-
through, comprising in combination: feeding
means for advancing the web through the ma-
chine, a metal detector roller over which said 25
web of material is fed by said feeding means,
a detector element including a flexible metallic
brush member pivotally mounted above said
roller and normally held separated therefrom by
said web, a finger pivotally mounted above and
30 adjacent each marginal edge of the web where
it passes over said roller, said fingers being nor-
mally held separated from the roller by the edges
of said web, said detector element and a said fin-
ger being engageable respectively with said metal 35
roller to electrically interrupt said feeding means
to stop the advancement of said web when an
imperfection in the web registers with said brush
member and when weaving and irregular travel
of the web on said roller permits contact be- 40
tween a said finger and said roller.

NICHOLAS PELOSI.