

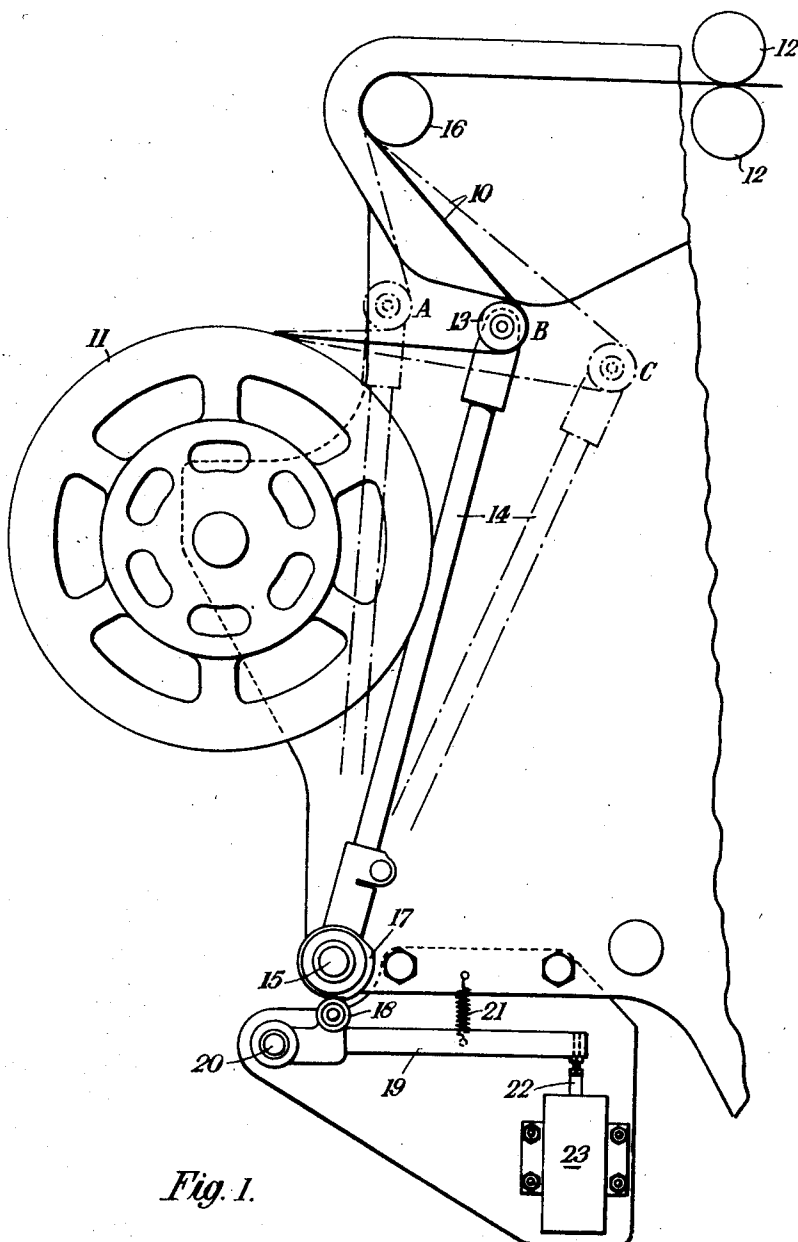
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H. BROOKE ET AL
WRAPPING OR LIKE MACHINES

2,903,635

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2 Sheets-Sheet 1



INVENTORS

HAROLD BROOKE,
GEORGE JAMES PARKER

By

Watson, Cole, Grindle & Watson
ATTORNEYS

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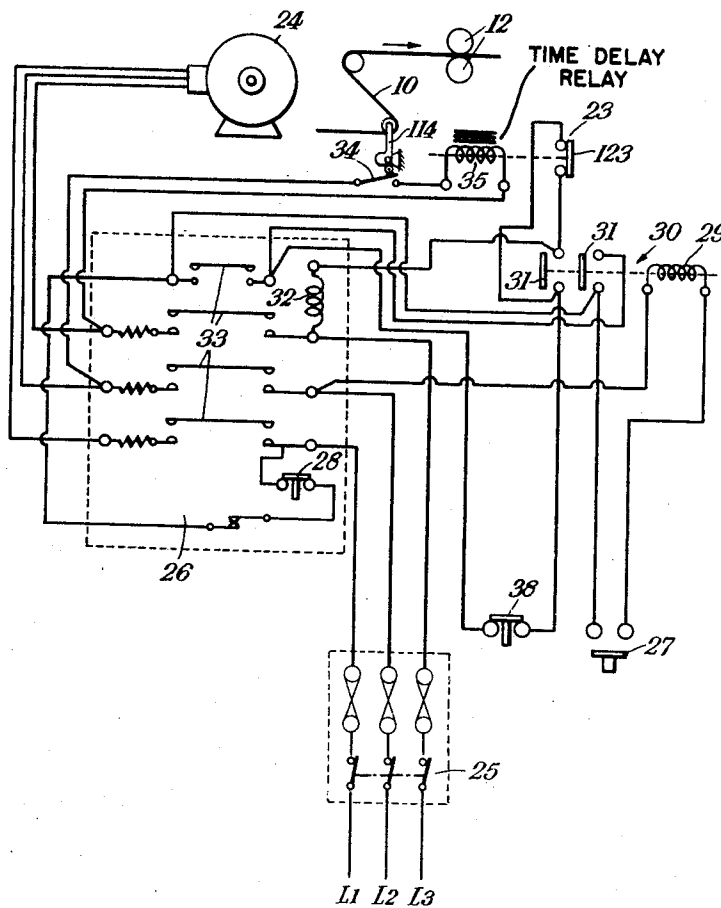


Fig. 2.

INVENTORS

HAROLD BROOKE,
GEORGE JAMES PARKER

By
Watson, Cole, Grindle & Watson
ATTORNEYS

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WRAPPING OR LIKE MACHINES

Harold Brooke, West Ardsley, Wakefield, and George James Parker, Scholes, Leeds, England, assignors to The Forgrove Machinery Company Limited, Leeds, England, a British company

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1 Claim. (Cl. 318—6)

In the case of wrapping, bag forming or like machines in which the articles to be dealt with are fed automatically to the machine, it is essential to have an automatic cut-out which will stop the machine in the event of any stoppage or break in the feed of wrapping material; otherwise the machine will continue to be fed with articles which have not been wrapped, and these articles will be mixed with wrapped articles and must afterwards be separated out by hand.

It is known to stop the machine, when the feed of wrapping material is defective, by arranging for a light trailing arm, which rests on the web of wrapping material, to operate, when the web sags, a machine-stopping switch wired directly into the circuit of an electric motor driving the machine. However, wrapping machines normally include a trip device for arresting the wrapper feed in the event of a gap in the procession of articles being fed to the machine, and it is undesirable for the machine to be stopped each time such a gap occurs. Also the trailing arm is liable to bounce in response to intermittent motion of the web and to operate the switch unnecessarily in response to momentary sagging of the web.

With a view to overcoming this disadvantage, the invention provides, in a wrapping, bag-forming or like machine, the combination, with means for feeding a web of sheet material to the machine, of a movable feeler arranged to bear against the web and to be displaced thereby to different positions in accordance with the tension of the web and a time delay switch operable by the feeler to stop the machine when, in response to slackness of the web, the feeler both moves into and dwells in an extreme position situated outside its normal range of movement.

Under normal running conditions the feeler oscillates between positions defining the limits of a comparatively small angular range, but if the web of sheet material breaks, or the feed of sheet material is interrupted, the feeler moves into an extreme position in which it actuates the time delay switch. This switch is only operated to stop the machine when the feeler remains at rest for a predetermined time in its extreme position. If the feeler moves into this position momentarily, the switch has not time to operate before the feeler returns to its normal working position. The machine accordingly continues to run so long as any slackness in the web is only temporary and is only stopped when there is a permanent stoppage in the feed of the web. The delay time imposed by the switch can, of course, be varied to suit the conditions of any particular machine.

The feeler may be constituted by a jockey arm, carrying a jockey roller bearing against the web and arranged to actuate the delay switch mechanically through the agency of a cam on the jockey arm which operates a spring-loaded lever to depress the plunger of the time delay switch when the jockey arm reaches its extreme position.

Alternatively the feeler can be arranged to actuate a micro-switch wired to a solenoid controlling the time delay

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switch. A fairly strong pressure is required to actuate the plunger of the time delay switch, and in the case of mechanical operation by the device sensitive to web tension it is necessary to use a jockey arm for the purpose. Where, however, the time delay switch is solenoid-operated, a light finger responsive to web tension may be employed as the feeler for actuating the controlling micro-switch.

Two embodiments of the invention will now be described in more detail, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a side elevation showing apparatus for feeding a web of wrapping material to a wrapping machine, in which a delay switch is mechanically operated by a jockey arm to stop the machine, when necessary, and

Fig. 2 is a circuit diagram of an alternative arrangement in which the delay switch is actuated electromagnetically, through the agency of a feeler responsive to web tension.

As shown in Fig. 1, a web 10 of wrapping material is fed from a reel 11 to a wrapping machine by feed rollers indicated diagrammatically at 12. The web 10 passes from the reel 11 to the feed rollers 12 over a jockey roller 13, carried by a jockey arm 14 pivoted at its lower end 15, and a guide roller 16. As an alternative, the web of wrapping material may be fed from the reel by a picker as described in U.S. patent specification No. 2,729,042.

Under normal conditions the jockey arm 14 oscillates, in response to variations in web tension, between positions A and B defining the limits of a comparatively small angular range. In the event, however, of breakage of the web 10 or interruption of the feed of wrapping material, the jockey arm 14 falls into the extreme position C. A cam 17 on the jockey arm 14 then coacts with a roller 18 on a lever 19, pivoted at 20, to rock the lever 19 clockwise against the action of a spring 21 to depress the plunger 22 of a time delay switch 23. The time delay switch 23 does not respond instantaneously to depression of its plunger 22, but, if the jockey arm 14 dwells in its extreme position C, the switch 23 operates to stop the electric motor driving the wrapping machine as shown in Fig. 2.

As indicated in Fig. 2, the three phase A.C. electric motor 24 is supplied with current from lines L₁, L₂ and L₃ through the agency of an isolating switch 25 and a starter 26. The time delay switch 23 has a quick make and a slow break and its contact 123 is normally closed, as shown. On depression of a starter button 27, a circuit is completed between lines L₁ and L₂, through the closed stop button 28 and the starter button 27, to energize the coil 29 of a double pole relay 30. The contacts 31 of the relay 30 then close, completing a circuit from line L₁ to line L₃ to energise the starter coil 32 through the closed contacts 31, 123 and the stop buttons 28, 38. The starter contacts 33 then close to supply current to the motor 24. A holding circuit for the coil 32 is established, from line L₁ to line L₃ through the two stop buttons 28, 38 and the closed contact 123 of the time delay switch 23. Obviously, therefore, the motor will be stopped on depression of either stop button or on opening of the contact 123.

The feeler responsive to the tension of the web 10 is constituted by a light finger 114 arranged, when it moves to its extreme position, to close a micro-switch 34, thereby completing a circuit between lines L₂ and L₃ to energize a solenoid 35 controlling the time delay switch 23. In the event of the feeler 114 dwelling in its extreme position, the contact 123 is therefore opened to de-energize the starter coil 32 and stop the motor 24. Where the feeler is constituted by a jockey arm acting mechanically on the time delay switch 23, as in Fig. 1, opening of the

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contact 123 of the time delay switch stops the motor in precisely similar fashion.

To restart the motor 24 after the contact 123 of the time delay switch has opened, it is only necessary to hold down the start button 27 long enough to cause the feeler 114 to be moved away from its extreme position allowing the contact 123 to close. The motor 24 will then continue to run after the start button 27 has been released.

Where two webs of wrapping material are used, one for an outer and the other for an inner wrapper, a feeler is provided for each web. These feelers may coact with individual micro-switches controlling a common time delay switch for stopping the motor. Alternatively, each feeler may be associated with an individual time delay switch for stopping the motor, operated by the feeler either mechanically, or through a micro-switch and solenoid.

What we claim as our invention and desire to secure by Letters Patent is:

In a wrapping, bag-forming or like machine, the combination, with an electric motor for driving said machine, of means for feeding a web of sheet material to the ma-

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chine, a movable feeler arranged to bear against said web and to be displaced thereby, in response to normal variations in tension of the web, to positions extending over a normal range of movement and, in response to excessive slackness of the web, to an extreme position outside said normal range, movements of said feeler into positions within said normal range being without effect on the speed of said motor, a micro-switch arranged to be operated by said feeler on movement thereof to its extreme position, a time delay switch for stopping said motor and electro-magnetically actuated means controlled by said micro-switch for actuating said delay switch to stop the motor in response to operation of said micro-switch for a predetermined period.

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