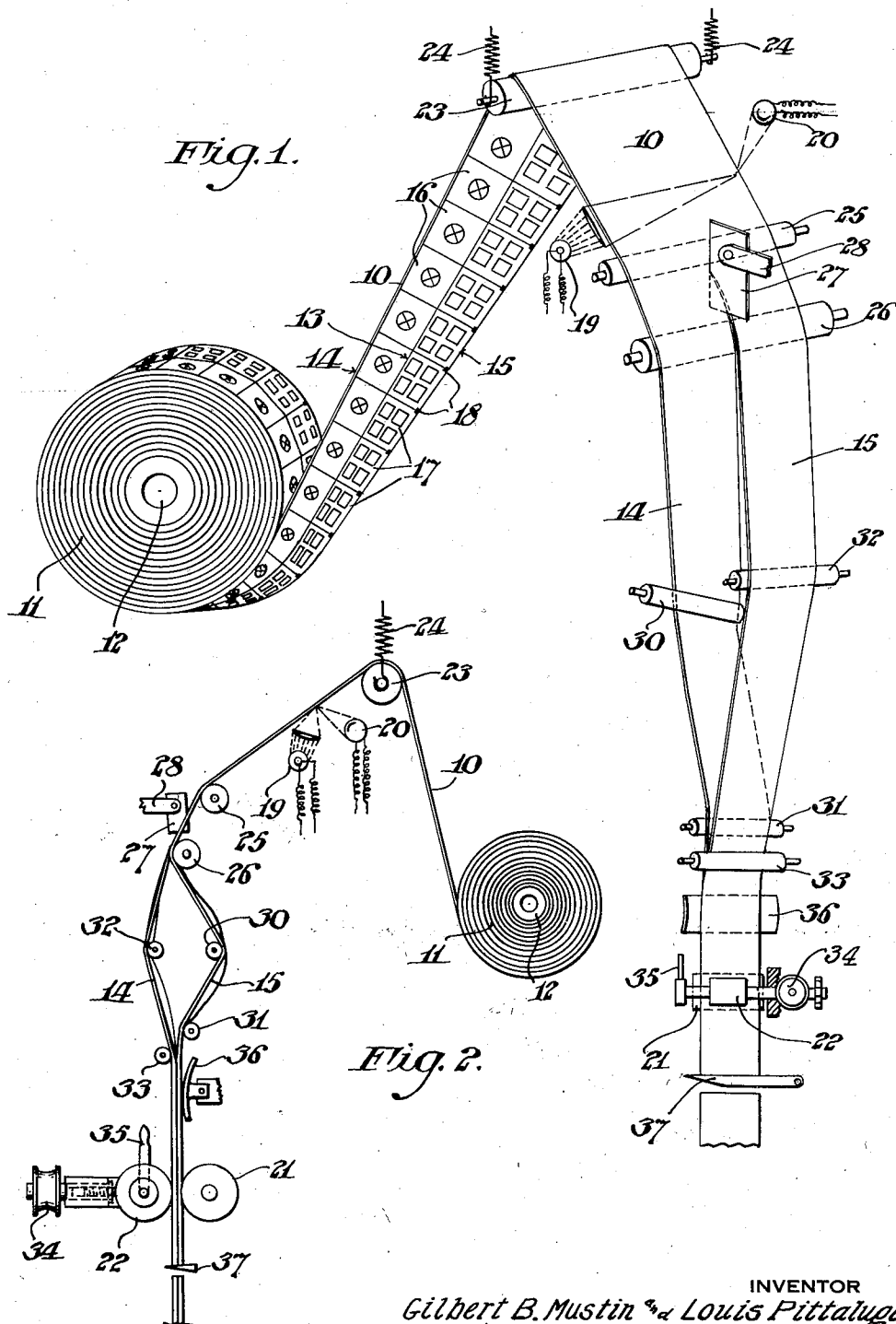


Sept. 10, 1940.

G. B. MUSTIN ET AL
PAPER REGISTERING MECHANISM

2,214,593

Filed Aug. 8, 1939



INVENTOR
Gilbert B. Mustin & Louis Pittaluga,

BY *Robert M. Bane*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,214,593

PAPER REGISTERING MECHANISM

Gilbert B. Mustin, Lansdowne, and Louis Pittaluga, Germantown, Pa., assignors to Frank H. Fleer Corporation, Philadelphia, Pa., a corporation of Delaware

Application August 8, 1939, Serial No. 288,945

8 Claims. (Cl. 164—65)

The present invention relates to paper registering mechanism and more particularly to a means for controlling the simultaneous feeding of two webs of wrapping material, one to serve as an inner wrapper and the other as an outer wrapper for an article.

Some of the objects of the present invention are to provide a mechanism wherein a single photo-electric cell assembly operates to maintain selected points respectively of two webs of paper in register with a predetermined point; to provide a paper feed control wherein a single roll of paper serves as the source of supply for two webs of material which are automatically maintained in registering relation with each other and with a predetermined point; to provide a paper feed control wherein a plurality of webs are fed to an operating point in such a way that the replacement time for an exhausted roll of paper is materially reduced; to provide a feed and control for printed paper which forms the inner and outer wrappers for an article whereby the cost of handling and printing is less than present costs for the same operation; to provide a novel method and apparatus for supplying two webs of material to an article wrapping machine while maintaining exact registration of design between the aforesaid webs; and to provide other improvements as will hereinafter appear.

In the accompanying drawing Fig. 1 represents a diagrammatic perspective of a paper registering and control mechanism embodying one form of the present invention; and Fig. 2 represents a diagrammatic side elevation of the same on a reduced scale.

Referring to the drawing one form of the present invention is shown operating upon and controlling a web 10 of wrapping paper which is drawn from a roll 11 rotatably mounted upon a suitable fixed support 12. This web 10 is subdivided longitudinally by a printed line 13 into two strips 14 and 15 extending lengthwise of the web and each in turn transversely subdivided by printing into a plurality of fields 16 and 17. Each field is of a size and shape such as will enable it to be wrapped about and enclose an article when cut out and separated from the web. While it is preferred to outline the fields by printed boundary lines, this is not essential because each field contains a design, cartoon or advertising material which in itself serves that purpose. The fields 16 of one strip 14 are transversely registered respectively with the fields 17 of the other strip 15 and this relation is maintained up to the wrapping point where one strip field then

becomes an inner wrapper for the article and the other strip field then becomes an outer wrapper.

For control purposes a black index 18 or index of contrasting color to the body of the web is printed between each field of one strip, these indicia being preferably aligned along one side edge of the web to pass in succession across a focussed light beam from a light source 19 for inspection by a properly located photo-electric cell 20.

Where the fields are transversely divided by a relative heavy line of printing this may serve as the control index for the cell 20 and a specially printed index omitted. By this construction a single photo-electric cell can be used for maintaining accurate registration of two strips of material and the cost of a second cell with its attendant control parts may be saved.

For feeding the web 10 its free end passes between a cylinder 21 and a control roller 22, the former being preferably of metal and the latter of resilient material. The free end of the web at this point has been divided into two lengthwise strips with one superposed upon the other in accordance with the invention as will be explained. The pressure of the roller 22 is automatically controlled by the registering mechanism in response to the action of the photo-electric cell 20, all as fully disclosed in Patents No. 2,119,670 and No. 2,108,767 granted respectively to A. S. Fitzgerald et al. on June 7, 1938 and Feb. 15, 1938. Proper tensioning of the web 10 as it feeds from the roll 11 is maintained by an idle roller 23 supported by tension springs 24. The web 10 thus leaves the roll 11 to pass over the tensioning roller 23 and then proceeds under the pull of the control roller 22 as pressed against the cylinder 21. The preferred arrangement is to locate the roller 23 above the roll 11 and then lead the web downwardly and substantially vertically into the feeding mechanism on its way to the cutting knife and wrapping machine.

In order to divide the web 10 so that the strips 14 and 15 become separate entities to serve respectively as the outer and inner wrappers of an article, the web 10 is guided over a pair of rollers 25 and 26 supported in relatively close spaced relation so that the portion of the web 10 between the rollers 25 and 26 is normally sufficiently taut to resist the pressure of a slitting blade 27. A suitable rigid support 28 positions the blade 27 in a plane normal to the web and with the cutting edge at a good severing angle with respect to the web 10. As shown the blade 27 is located substantially on the median line of the web but

this is only by way of example and it may be laterally shifted so that the resulting division is into two strips, one wider than the other.

To cause the strips 14 and 15 to assume a superposed relation, a deflecting roller 30 for the strip 14 is supported in rearwardly spaced relation to the strip 15 and serves to divert the strip 14 laterally and angularly towards the strip 15. A restoring roller 31 for the strip 14 is positioned at such a distance from the roller 30 as will cause the strip 14 to aline with the registering control feed rollers 21 and 22. The supporting means for the deflecting roller 30 allows the latter to be angularly adjusted so that the strip 14 can be definitely positioned as to angular deflection, this in the present instance being approximately one-half the width of the strip 14. Also the angular position of the restoring roller 31 is such that the angular path of the strip 14 is converted into a straight away path to the feed rollers 21 and 22. To carry out this action the strip 14 passes under the angularly disposed deflecting roller 30 and over the restoring roller 31. The strip 15 simultaneously travels over a deflecting roller 32, which is forwardly spaced from the former path of the web, and then under a restoring roller 33 located in close proximity to the roller 31. The roller 32 is adjustable as to angularity but as shown is positioned to deflect the strip 15 substantially one-half its width laterally towards the strip 14. The roller 33 in turn diverts the strip 15 into a path parallel to that of the strip 14, the two strips then being in face to face contact and travelling as one, since both are still under the same feed control as regulated by the roller 22, and the registration as governed by the photo-electric control remains constant. Creep or lag during feeding is automatically corrected by this control, which actuates the worm wheel 34 to shift the roller 22 towards or away from the web as fully explained in the aforesaid patents. A lever 35 makes it possible to operate this control manually and is more particularly for use in initially bringing a new web into registration.

After leaving the restoring rollers 31 and 33 the two superposed strips are led over a fixed guide plate 36 to maintain the strips in face to face relation to enter the feed rollers 21 and 22. A severing knife 37 is located at the point where registration of the indicia takes place and is operated by any suitable mechanism properly timed for exact cutting off of the respective printed fields. Each such pair of fields as separated from the web enter the wrapping machine (not shown) which function to wrap one field about the article as an inner wrapper and then the other about the wrapped article as an outer wrapper.

From the foregoing it will be apparent that an ingenious and novel control has been devised whereby a single paper web is under control by a photo-electric cell for registration with a transversely operating severing knife so that lengths are cut at predetermined transverse distances so that each length displays a complete design or advertising matter. After inspection by the photo-electric cell the web is divided longitudinally into two strips which are fed through a deflecting and restoring mechanism in such a manner that one strip takes a position in superposed relation to the other and emerge from such mechanism in face to face relation for delivery to the severing device. Since the single web and its subdivided parts are drawn to the severing device by the same feeding means it will be evident

that correct registration of the single web will be followed by registration of the subdivided parts or strips and consequently it is possible for respective designs in both strips to remain accurately alined and be cut off as complete designs for delivery to the wrapping machine.

While only a single form is shown in which this invention may be embodied, it is to be understood that the invention is not limited to any specific instruction, but might be applied to various forms without departing from the spirit of the invention or the scope of the appended claims. While reference has been made to "paper" specifically, this is only by way of illustration and this term is to be considered broadly as a web made of Cellophane, Glassine, Pliofilm or any other suitable wrapping material.

Having thus described our invention, we claim:

1. A paper control mechanism consisting of a severing device for cutting a web transversely into predetermined lengths, a feed mechanism for drawing said web into position to be cut by said severing device, said web having a longitudinally arranged row of fields designated on one side thereof and occupying a portion of the width thereof and a second longitudinally arranged row of fields designated on the same side thereof and occupying the other portion of the width thereof, the fields of one row being registered respectively with the fields of the other row, said web also having indicia thereon for registering control purposes, means for slitting said web between the rows of fields to form two lengthwise strips, means to superpose one strip on the other for delivery to said severing device, and means including a photo-electric cell coacting with said indicia to maintain said web registered with said severing device for detaching two complete fields at each operation of said device.

2. A paper control mechanism consisting of a severing device for cutting a web transversely into predetermined lengths, a feed mechanism for drawing said web into position to be cut by said severing device, said web having a longitudinally arranged row of fields designated on one side thereof and occupying a portion of the width thereof and a second longitudinally arranged row of fields designated on the same side thereof and occupying the other portion of the width thereof, the fields of one row being registered respectively with the fields of the other row, said web also having indicia thereon for registering control purposes, means for slitting said web between the rows of fields to form two lengthwise strips, a guide for deflecting one of said strips toward and under the second strip, a second guide for deflecting the second strip toward and over the first strip, restoring means for changing the direction of one strip to aline with the other in superposed relation, and means including a photo-electric cell coacting with said indicia to maintain said web registered with said severing device for detaching two complete fields at each operation of said device.

3. A paper control mechanism consisting of a severing device for cutting a web transversely into predetermined lengths, a feed mechanism for drawing said web into position to be cut by said severing device, said web having a longitudinally arranged row of fields designated on one side thereof and occupying a portion of the width thereof and a second longitudinally arranged row of fields designated on the same side thereof and occupying the other portion of the width thereof, the fields of one row being registered

respectively with the fields of the other row, said web also having indicia thereon for registering control purposes, means for slitting said web between the rows of fields to form two lengthwise strips, an angularly adjustable guide for deflecting one of said strips toward and under the second strip, a second angularly adjustable guide for deflecting the second strip toward and over the first strip, restoring means for changing the direction of one strip to aline with the other in superposed relation, and means including a photo-electric cell coacting with said indicia to maintain said web registered with said severing device for detaching two complete fields at each operation of said device.

4. A paper control mechanism consisting of a severing device for cutting a web transversely into predetermined lengths, a feed mechanism for drawing said web into position to be cut by said severing device, said web having a longitudinally arranged row of fields designated on one side thereof and occupying a portion of the width thereof and a second longitudinally arranged row of fields designated on the same side thereof and occupying the other portion of the width thereof, the fields of one row being registered respectively with the fields of the other row, said web also having indicia thereon for registering control purposes, means for slitting said web between the rows of fields to form two lengthwise strips, a guide for deflecting one of said strips toward and under the second strip, a second guide for deflecting the second strip toward and over the first strip, restoring means for changing the direction of one strip to aline with the other in superposed relation, means to deliver said strips in face to face relation to said severing device, and mean including a photo-electric cell coacting with said indicia to maintain said web registered with said severing device for detaching two complete fields at each operation of said device.

5. A paper control mechanism consisting of a severing device for cutting a web transversely into predetermined lengths, a feed mechanism for drawing said web into position to be cut by said severing device, said web having a longitudinally arranged row of fields designated on one side thereof and occupying a portion of the width thereof and a second longitudinally arranged row of fields designated on the same side thereof and occupying the other portion of the width thereof, the fields of one row being registered respectively with the fields of the other row, said web also having indicia thereon for registering control purposes, means for slitting said web between the rows of fields to form two lengthwise

strips, a guide for deflecting one of said strips toward and under the second strip, a second guide for deflecting the second strip toward and over the first strip, means to restore said first strip to the normal direction of web travel, means to restore said second strip to the normal direction of web travel but superposed with respect to said first strip, and means including a photo-electric cell coacting with said indicia to maintain said web registered with said severing device for detaching two complete fields at each operation of said device.

6. A paper control mechanism consisting of a severing device for cutting a web transversely into predetermined lengths, said web having indicia thereon related to said lengths for control purposes, a feeding mechanism for drawing said web into operative relation to said device, means to slit said web longitudinally into two strips for delivery to said severing device, means to cause said strips to take a superposed face to face relation for delivery to said severing device, and means including a photo-electric cell coacting with said indicia to maintain said web strips simultaneously registered with said severing device.

7. The method of registering two strips of material, which consists in feeding toward a severing point a single web having two rows of design fields thereon arranged in transverse alined relation with control points therebetween, conditioning a control to govern the travel of said web to maintain a registering relation between the respective points on said web and said severing point, slitting said web longitudinally into two strips after said conditioning step, causing one strip to be superposed upon the other, and severing each superposed pair of design fields from said strips.

8. The method of registering two strips of material, which consists in feeding toward a severing point a single web having two rows of design fields thereon arranged in transverse alined relation with control points therebetween, conditioning a control to govern the travel of said web to maintain a registering relation between the respective points on said web and said severing point, slitting said web longitudinally into two strips after said conditioning step, causing one strip to be superposed upon the other in back to face relations and with two fields previously laterally opposite now disposed one above the other, and severing each superposed pair of design fields from said strips.

GILBERT B. MUSTIN.
LOUIS PITTALUGA.