April 29, 1969 J. HARRISON 3,440,796

TOPWRAP APPARATUS

Filed June 2, 1966 Sheet 1 of 4

Fig. 1.

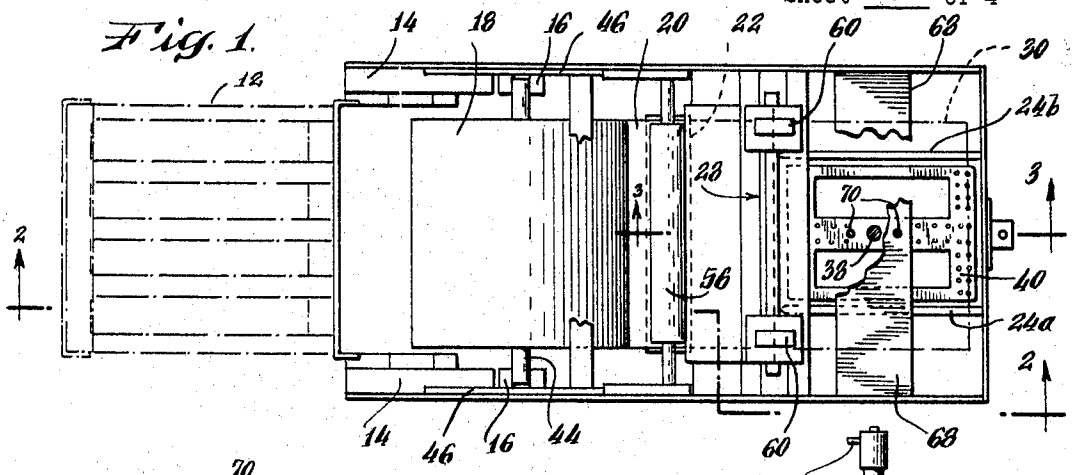


Fig. 5.

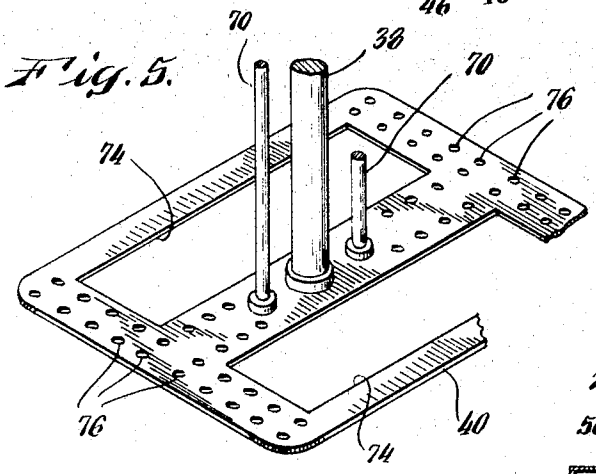


Fig. 2.

INVENTOR
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ATTORNEYS

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TOPWRAP APPARATUS

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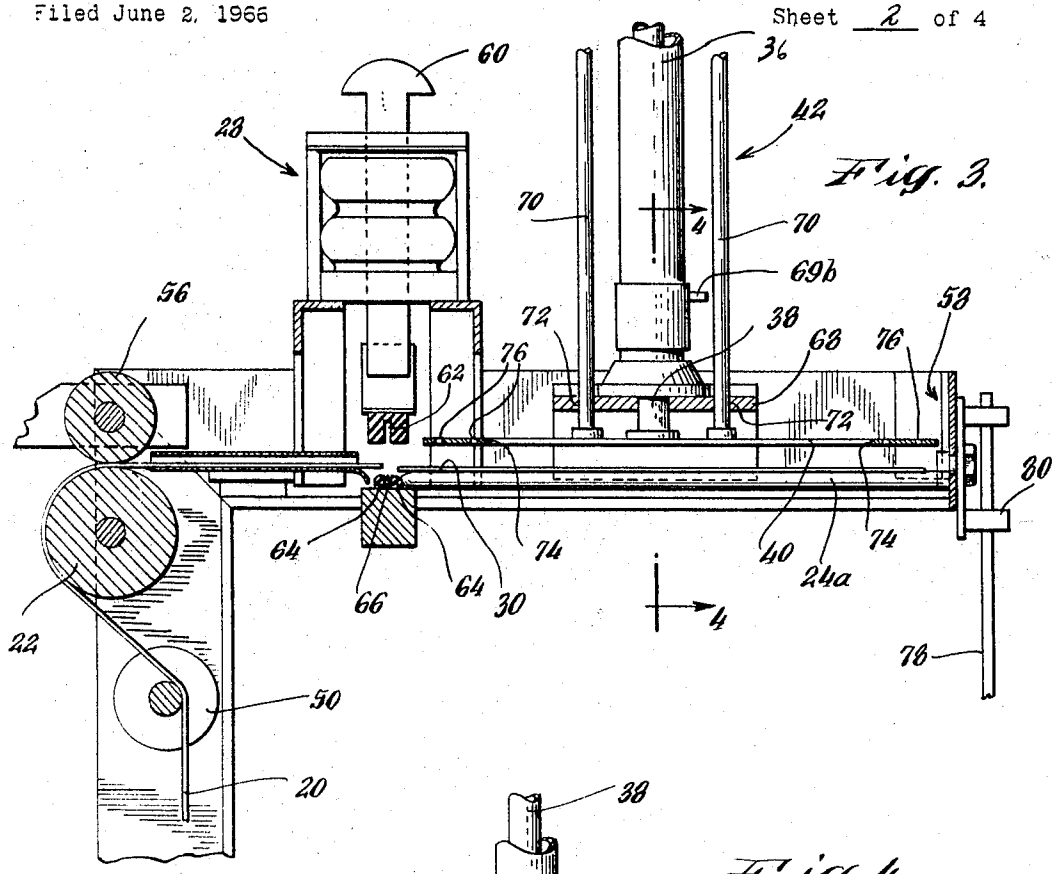


Fig. 3.

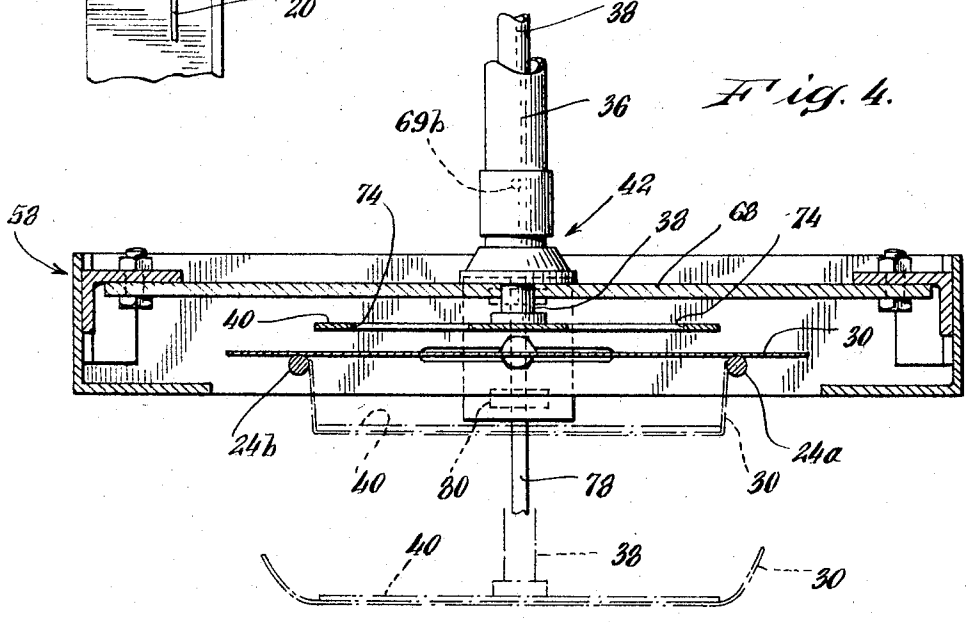


Fig. 4.

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TOPWRAP APPARATUS

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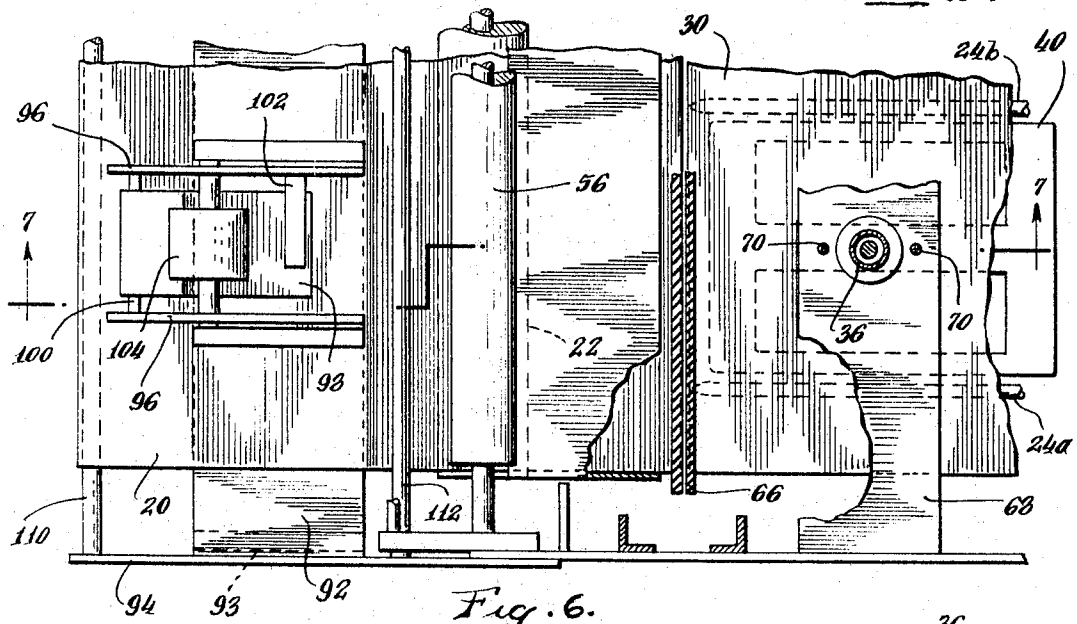


Fig. 6.

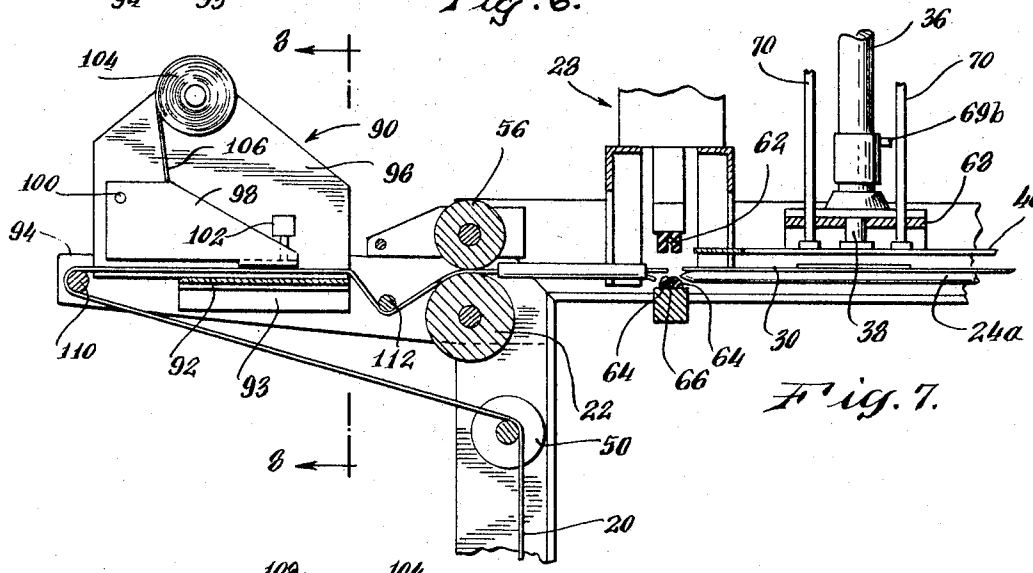


Fig. 7.

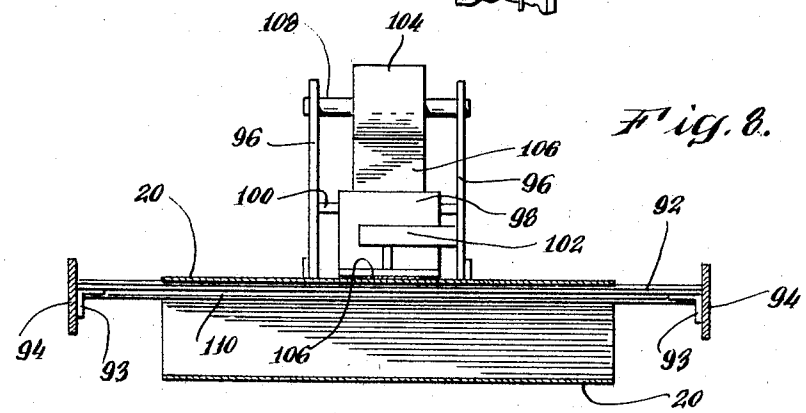
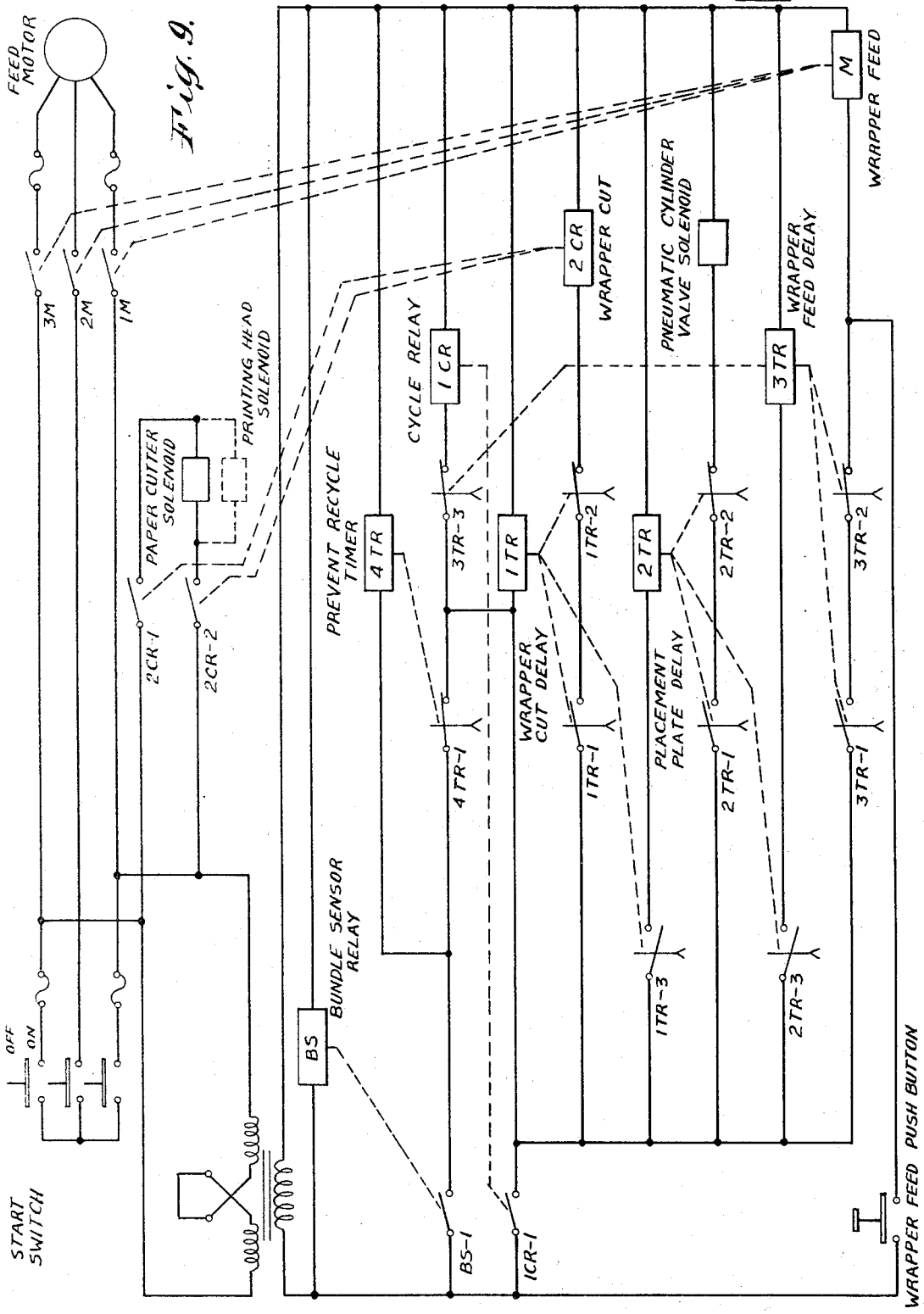


Fig. 8.

TOPWRAP APPARATUS

Fig. 9.



United States Patent Office 3,440,796
Patented Apr. 29, 1969

3,440,796

TOPWRAP APPARATUS

James Harrison, Thorn Hill, Ontario, Canada, assignor to General Strapping Company, Division of Harrison White, Incorporated, Bedford Hills, N.Y.

Filed June 2, 1966, Ser. No. 554,786
Int. Cl. B65b 57/12; B67b 5/04
U.S. Cl. 53—74 9 Claims

ABSTRACT OF THE DISCLOSURE

The disclosed apparatus produces individual topwrap sheets from a continuous roll of wrapper material and places the sheets on bundles such as a stack of newspapers, magazines or the like in a continuous operation. Wrapper material is fed from a roll through a cutter and into position on a pair of support bars over a bundle conveyor. A reciprocable placement plate temporarily deforms and carries each cut topwrap sheet down through the support bars and places it on a bundle top. The apparatus is controlled electrically by a control mechanism which provides for sequential operation of the various functions of the apparatus and for predetermined delays between the functions. Means are also provided to prevent the apparatus from recycling before a previous cycle is completed.

In the bundling of stacked newspapers or magazines, sheets of protective material such as paper or plastic are placed on the upper and lower surfaces of the bundle. These sheets, respectively called topwrap and underwrap sheets, protect the outermost copies of the newspapers or magazines from the elements, and minimize damage due to abrasion resulting from loading or unloading.

Prior art topwrap machines, such as the one illustrated in my United States Patent No. 3,026,659, require the use of pre-cut topwrap sheets. The use of such sheets entails the added expense of pre-cutting to size and stacking for use in the machine. The heavy stack of pre-cut topwrap sheets makes loading difficult and a complex feed mechanism is required to raise and position sheets for placement on the top surface of a bundle. The stacked sheets also have a tendency to stick together, further complicating the process of feeding them into position for placement on the bundle.

I have now found that the above problems, among others, are eliminated in my present topwrap apparatus which uses a continuous roll of wrapper material rather than pre-cut sheets, and which produces individual topwrap sheets from the roll as required.

Accordingly, an object of the present invention is to provide a topwrap apparatus which produces individual topwrap sheets as required from a continuous roll of wrapper material.

Another object of the invention is to provide an apparatus of the above character in which topwrap sheets are supported at their edges in position for placement on a bundle by an inexpensive pair of support bars.

Another object of the invention is to provide an apparatus of the above character which places topwrap sheets on bundles in a continuous operation.

A further object of the invention is to provide an apparatus of the above character which is electrically controlled through a predetermined cycle.

Another object of the invention is to provide an apparatus of the above character in which loading of wrapper material can be done easily and expeditiously.

A further object of the invention is to provide an apparatus of the above character which automatically addresses or labels a topwrap sheet before placing it on a bundle.

A still further object of the invention is to provide apparatus of the above character which is simple in construction and reliable and practical in operation.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

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

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:

FIGURE 1 is a top plan view of the topwrap apparatus of the present invention with portions of the superstructure cut away to reveal the workings thereof;

FIGURE 2 is a side elevation view of the topwrap apparatus, partly in section, taken along the line **2—2** of FIGURE 1;

FIGURE 3 is an enlarged partial sectional view of a portion of the apparatus taken along the line **3—3** of FIGURE 1;

FIGURE 4 is a partial sectional view of the placement plate assembly of my topwrap apparatus taken along the line **4—4** of FIGURE 3;

FIGURE 5 is a greatly enlarged perspective view, partially cut away, of the placement plate together with a portion of its supporting assembly;

FIGURE 6 is an enlarged partial top plan view of an embodiment of the apparatus which includes a labelling or addressing mechanism;

FIGURE 7 is a partial sectional view of a portion of the apparatus taken along the line **7—7** of FIGURE 6;

FIGURE 8 is a partial sectional view of a portion of theh apparatus taken along the line **8—8** of FIGURE 7;

FIGURE 9 is a schematic representation of the electrical control circuitry for the apparatus of the invention.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Generally and with reference to FIGURES 1 and 2, the topwrap apparatus of the present invention produces individual topwrap sheets from a continuous roll of wrapper material, and places the sheets on bundles moving continuously along a conveyor. It comprises a feed roll loading mechanism shown generally at **10** including a loading ramp **12**, guide flanges **14**, and roll supports **16** upon which is mounted a feed roll **18** of paper or other suitable wrapper material. A continuous strip **20** of wrapper material is fed from feed roll **18** by means of a power roll **22** to a pair of support bars **24***a*, **24***b* positioned above a conveyor **26**. A paper cutter shown generally at **28** is actuated to sever the strip **20** into a topwrap sheet **30** of desired length when a bundle **32** moving along conveyor **26** intersects the light beam reaching photocell **34**. Once severed, the sheet **30** is held in posi-

tion over bundle 32 only by the support bars 24*a*, 24*b*. Substantially simultaneously with the severance of sheet 30, an air cylinder 36 is actuated to move piston 38 and the attached placement plate 40 downward between and through support bars 24*a*, 24*b*, carrying topwrap sheet 30 to its intended position atop bundle 32. The placement plate assembly 42 then retracts and the cycle repeats as another bundle moves into position on conveyor 26. The cycle of the machine is electrically controlled by a control circuit shown schematically in FIGURE 9.

More specifically, the roll of wrapper material 18 is supported by its axle 44 in a pair of roll supports 16 secured to the sidewall of roll compartment 48. The loading of roll 18 is accomplished by lowering ramp 12 as shown by the dashed lines in FIGURES 1 and 2. The roll of wrapper 18 is rolled up lowered ramp 12 until axle 44 is rollingly supported by the guide flanges 14. By closing ramp 12, roll 18 is pushed and rolls over guide flanges 14 into position on roll supports 16 inside roll compartment 48.

The wrapper strip 20 is threaded around a guide roll 50 with a loop extending down between tensioning bar guide rails 52. A tensioning bar 54 is loosely inserted in the guide rails 52 through the loop where it can reciprocate vertically in response to the sudden pull of power roll 22. Thus, there is an accumulation of slack in strip 20 which minimizes the danger of tearing due to the sudden pull of power roll 22. The strip 20 is fed between the power roll 22 (which is driven by a feed motor shown in FIGURE 9) and a follower roll 56. Both the power roll 22 and the follower roll 56 are journalled to the apparatus frame. The power roll 22 is actuated intermittently, in a manner more fully described hereinafter, to extend a length of strip 20 over a pair of support bars 24*a*, 24*b* which are positioned on an extension 58 of the apparatus frame.

A paper cutter 28 is secured to frame extension 58 in position to sever strip 20 into topwrap sheet having a desired length (FIGURES 2 and 3). The cutter comprises a pair of solenoids 60 secured to frame extension 58 which actuate the attached slotted rubber bumper 62 positioned above and extending transversely across the path of strip feed. While a solenoid controlled cutter is shown, it will be understood that other types, such as a pneumatically controlled cutter, may also be used. A pair of spring loaded rubber cheeks 64 are positioned below and extend transversely across the path of strip feed and surround a transversely positioned blade 66. When the cutter 28 is actuated, the bumper 62 depresses the cheeks 64, exposing blade 66 to cut sheet 20.

The placement plate assembly 42 of the topwrap apparatus (FIGURES 2, 3, and 4) is fastened to a frame cross bar 68, and is positioned directly above and symmetrically centered between support bars 24*a*, 24*b*. The assembly 42 comprises a pneumatic cylinder 36 secured to cross bar 68 which encloses a reciprocal piston 38 terminating at its lower end in placement plate 40 (FIG. 5). The reciprocation of piston 38 is effected by the alternate passage of air or other fluid through valves 69*a* and 69*b* which are alternately opened and closed by a valve solenoid (FIG. 9). A pair of bracing rods 70 (FIG. 3) are attached to placement plate 40 and extend axially along either side of the pneumatic cylinder 36. The rods 70 are slidably retained in guide holes 72 extending through cross bar 68. The support bars 24*a*, 24*b* are fastened to frame extension 58 parallel to its longitudinal axis, and are spaced apart somewhat less than the width of the severed topwrap sheet 30 so that it is supported by its edges thereon (FIGURES 3 and 4). A simple and inexpensive pair of support bars 24*a*, 24*b* are thus all that is required to hold and position the severed topwrap sheet for placement on a bundle 32 moving along conveyor 26. The width of placement plate 40 is slightly less than the separation of support bars 24*a*, 24*b* so that it temporarily deforms topwrap sheet 30 and readily carries it between bars 24*a*, 24*b* as shown in FIGURE 4.

A plurality of apertures 74 and perforations 76 (FIGURE 5) are provided in placement plate 40 to prevent the formation of a vacuum between it and topwrap sheet 30, thereby facilitating separation after placement on the bundle 32.

As shown in FIGURES 2 and 3, a photoelectric cell 34 is suspended from frame extension 58 by a rod 78 fastended to bracket 80. A light source 82 is secured to the apparatus frame in registry with the photoelectric cell. The photoelectric cell actuates the electrical control circuit as is more fully described hereinafter. However, as will be understood by one skilled in the art, a sonically controlled switch, a pressure switch, or other actuator may be used in place of the photoelectric cell.

Referring to FIGURE 2, a conveyor belt 84 is supported on a plurality of rollers 86 which are journalled to a conveyor frame 88. The conveyor 26 is positioned directly beneath frame extension 58 and moves transversely to the longitudinal axis of extension 58 to carry bundles into position for placement of the topwrap sheet 30.

As shown in FIGURES 6, 7, and 8, a labeling or addressing mechanism 90 may be incorporated into the topwrap apparatus of the invention. A platen 92 is supported by a pair of flanges 93 each fastened to one of a pair of support arms 94 which extend from the apparatus frame adjacent to the power roll 22. A bifurcated frame 96 extends from platen platform 92 and carries a printing head 98 pivotally suspended on an axle 100 extending between the arms of frame 96. The printing head 98 is actuated by solenoid 102, although a pneumatic or other type actuator can be used. A label roll 104 carrying a continuous strip of labeling material 106 is rotatably supported on an axle 108 fastened between the arms of frame 96.

In this embodiment of the invention, wrapper strip 20 is threaded under tensioning bar 54 around guide roll 50 as previously described. To feed the strip 20 through the labelling or addressing mechanism 90, it is threaded around a first guide bar 110, over platen 92, and under a second guide bar 112 all positioned between arms 94. The strip 20 is then fed between power roll 22 and follower roll 56. The actuation of printing head 96 by the printing head solenoid 102 serves to affix a strip of labeling material 106 to wrapper 22 just prior to the severing of wrapper 22 into a topwrap sheet 30. The printing head 96 prints an address or other information on the strip of labeling material 106 at the same time that it affixes it to wrapper 22; however, the labelling material 106 may be pre-printed with an address or other information, and the action of printing head 98 may serve only to affix strip 106 to wrapper 20.

The operation of the topwrap apparatus can best be described in conjunction with a description of the control circuitry shown schematically in FIGURE 9. To begin the cycling of the machine, topwrap strip 20 is threaded under tensioning bar 54 and over power roll 12 as hereinabove described. By pressing the start switch (FIG. 9), power is supplied to the control circuit of the apparatus. The machine will cycle once since the normally open contacts in the bundle sensor relay (BS) are closed until the photocell light source 82 is activated. At the same time, the conveyor 26 with bundles 32 spaced thereon is put into motion. As the first bundle 32 breaks the beam from the light source 82, the bundle sensor relay (BS) is actuated, and normally opens contacts BS-1 close actuating cycle relay (1CR) and timer (4TR). The bundle sensor relay (BS) remains energized until the photoelectric beam is re-established. The cycle relay (1CR) remains energized with its normally open contacts 1CR-1 closed until the end of the apparatus cycle. Timer (4TR), after a short delay to allow energization of cycle relay (1CR),

opens contacts 4TR-1. Contacts 4TR-1 are held open by timer (4TR) until the photoelectric beam is re-established, at which time timer (4TR) resets substantially instantaneously. Thus, as will be seen from FIGURE 9, further cycling of the machine is prevented until a previous cycle is completed and the photoelectric beam is re-established.

The closing of the contacts 1CR-1 energizes the coil of Agastat timer (1TR). The Agastat timer, manufactured by the Elastic Stop Nut Corporation of America, Elizabeth, New Jersey, is electrically operated but the speed at which the solenoid core moves to actuate the contacts therein is adjustably controlled by a pneumatic valve. As the solenoid core in timer (1TR) moves, the normally closed but held open contacts 1TR-1 are allowed to close (preferably after a delay of 5–10 milliseconds for reasons explained hereinbelow) energizing the coil of relay (2CR). Normally open contacts 2CR-1 and 2CR-2 in relay (2CR) close and energize paper cutter solenoids 60 (FIGURES 1 and 3) and, where used, printing head solenoid 102 (FIGURE 7). Thus, one topwrap sheet is formed in place on support bars 24*a*, 24*b* and, where desired, an address or a label is affixed to the portion of wrapper strip which will form a succeeding topwrap sheet.

As the solenoid core in timer (1TR) completes its travel, normally closed contacts 1TR-2 open and de-energize the coil of relay (2CR). The contacts of relay (2CR) open, de-energizing the cutter solenoids 60 and, when used, the printing head solenoid 102, allowing the paper cutter 28 and the printing head 98 to return to their rest positions (FIGURES 3 and 7). The normally open contacts 1TR-3 close as the solenoid core in timer (1TR) completes its travel energizing the coil of Agastat timer (2TR).

As the solenoid core in timer (2TR) begins to move, it actuates (desirably after a brief delay of 10–20 milliseconds) the normally closed but held open contacts 2TR-1. These close, energizing the coil of the pneumatic cylinder valve solenoid (FIGURE 9) causing piston 38 and attached placement plate 40 to move downward carrying the topwrap sheet 30 into position atop bundle 32.

The 10–20 millisecond delay before actuation of the piston 38 is desirable since it allows the paper cutter bumper 62 time to move away from the topwrap sheet 30 (FIGURE 3) to prevent snagging as the topwrap sheet 30 is temporarily deformed, and pushed through the support bars 24*a*, 24*b* by placement plate 40 (FIGURES 3 and 4). As the solenoid core in timer (2TR) completes its travel, the normally closed contacts 2TR-2 open de-energizing the coil of the pneumatic cylinder valve solenoid returning piston 38 and attached placement plate 40 to their rest positions (FIGURE 3). At the same time the normally open contacts 2TR-3 in timer (2TR) close energizing the coil of Agastat timer (3TR).

As the solenoid core in timer (3TR) moves, it actuates the normally closed but held open contacts 3TR-1 which close, energizing the coil of feed motor relay (M) and closing contacts 1M, 2M, and 3M. The feed motor, which is connected to power roll 22, starts and feeds wrapper strip 20 across the support bars 24*a*, 24*b*. After a short period of solenoid core travel (preferably in the order of ½ second) during which wrapper strip is fed across the length of support bars 24*a*, 24*b*, the solenoid core opens normally closed contacts 3TR-2 and 3TR-3, respectively de-energizing the coils of feed motor relay (M) and relay (1CR). The feed motor stops and the contacts 1CR-1 of relay (1CR) open, de-energizing the coils of timers (1TR), (2TR), and (3TR) which reset substantially instantaneously for the next apparatus cycle.

As hereinabove noted, a delay of 5–10 milliseconds is preferably provided before actuation of relay (2CR) which energizes the paper cutter solenoids 60. This short delay allows the feed motor to coast before the next topwrap sheet 30 is severed, assuring that a full length of wrapper strip 20 is extended across the support bars 24*a*, 24*b* between the cycles.

As will be understood by one skilled in the art, the functions of one or more of the timers and relays of the control mechanism described hereinabove may be performed by appropriate limit switches actuated by movement of the apparatus parts and/or of the wrapper as it is fed, cut and placed on a bundle.

Thus, the topwrap apparatus of the present invention exhibits numerous advantages in comparison to prior art machines. The use of a continuous roll of wrapper simplifies loading, and enables topwrap sheets to be cut as needed, thus, eleminating the expense of pre-cutting and stacking. The continuous strip of wrapper material is fed by a simple combination of rollers, and any possibility of inadvertently feeding multiple sheets is eliminated. Moreover, only a simple pair of support bars are required to position the sheets for placement on a bundle. The apparatus of the invention is electrically controlled for fully automatic operation and, where desired, addresses or labels can be automatically applied to each topwrap sheet prior to its placement on a bundle.

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 and specific features of the invention herein described, and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An apparatus for placing topwrap sheets on bundles comprising, in combination:
   - (A) means for feeding a continuous strip of wrapper material,
   - (B) a cutter adjacent the path of travel of said strip for severing said strip to form a topwrap sheet,
   - (C) opposed and spaced supports positioned below said path of travel to support said severed topwrap sheet inwardly from its edges and in alignment with the upper surface of one of said bundles,
   - (D) a reciprocable placement plate positioned over said supports for temporarily deforming said topwrap sheet and carrying it through said supports to the upper surface of one of said bundles,
   - (E) a conveyor for continuously moving said bundles into position for receipt of said topwrap sheet, and
   - (F) a control mechanism for guiding said apparatus through a predetermined cycle comprising means for actuating said mechanism in response to passage of said bundles over said conveyor, means for sequentially actuating said cutter, said placement plate and said feeding means in coordination with the passage of said bundles over said conveyor to cut and place a topwrap sheet on each said bundle, and means for preventing the recycling of said apparatus until a previous cycle is completed.

2. An apparatus as defined in claim 1 wherein said supports comprise:
   - (A) a pair of substantially parallel support bars,
     - (1) spaced apart less than the width of said severed topwrap sheet but more than the width of said placement plate, and
     - (2) positioned symmetrically under said placement plate to align said topwrap sheet with the upper surface of one of said bundles.

3. An apparatus as defined in claim 1 and further including means adjacent the path of travel of said strip for producing tension and accumulating slack in said strip to minimize the danger of tearing during the feeding thereof.

4. An apparatus as defined in claim 1 and further including labelling means positioned adjacent to and traversing the path of travel of said strip for affixing printed matter thereto.

5. An apparatus as defined in claim 4 wherein said labelling means comprises:

(A) a printing head positioned over the path of travel of said strip;

(B) a platen positioned under said printing head below the path of travel of said strip;

(C) means feeding labelling material between said printing head and said strip; and

(D) means actuating said printing head toward said platen to affix said labelling material to a portion of said strip;

said labelling means being positioned to act on said strip portion prior to severance thereof by said cutter into topwrap sheet.

6. An apparatus for placing topwrap sheets on bundles comprising, in combination:

(A) means for feeding a continuous strip of wrapper material,

(B) a cutter adjacent the path of travel of said strip for severing said strip to form a topwrap sheet,

(C) opposed and spaced supports positioned below said path of travel to support said severed topwrap sheet inwardly from its edges and in alignment with the upper surface of one of said bundles,

(D) a reciprocable placement plate positioned over said supports for temporarily deforming said topwrap sheet and carrying it through said supports to the upper surface of one of said bundles,

(E) a conveyor for continuously moving said bundles into position for receipt of said topwrap sheet, and

(F) electrical control circuitry for guiding said apparatus through a predetermined cycle comprising

(1) bundle sensing means responsive to passage of said bundles over said conveying means,

(2) cycle switching means activated by said bundle sensing means,

(3) recycle timing means actuated by said bundle sensing means to prevent the recycling of said apparatus until a previous cycle is completed,

(4) cutter timing means responsive to actuation of said cycle switching means for sequentially activating a first plurality of switches,

(a) said cutter timing means being adjustable to provide a predetermined delay before the actuation of each of said first plurality of switches,

(5) cutter switching means, responsive to actuation of a first of said first plurality of switches to actuate said cutter to form a topwrap sheet, and responsive to actuation of a second of said first plurality of switches to return said cutter to its rest position,

(6) placement plate timing means responsive to actuation of a third of said first plurality of switches for sequentially actuating a second plurality of switches,

(a) said placement plate timing means being adjustable to provide a predetermined delay before actuation of each of said second plurality of switches,

(b) a first switch of said second plurality of switches being adapted to actuate said placement plate,

(c) a second switch of said second plurality of switches being adapted to return said placement plate to its rest position,

(7) feed timing means responsive to actuation of a third switch of said second plurality of switches to actuate a third plurality of switches,

(a) said feed timing means being adjustable to provide a predetermined delay before actuation of each of said third plurality of switches,

(b) a first switch of said third plurality of switches being adapted to energize said feeding means and extend a predetermined length of said strip over said supports,

(c) a second switch of said third plurality of switches being adapted to de-energize said feeding means, and

(d) a third switch of said third plurality of switches being adapted to de-activate said cycle switching means.

7. An apparatus as defined in claim 6 and further including a labelling mechanism positioned adjacent the path of travel of said strip, and means for actuating said mechanism substantially simultaneously with actuation of said cutter to affix printed matter to said strip.

8. An apparatus for placing topwrap sheets on bundles comprising, in combination:

(A) means for feeding a continuous strip of wrapper material,

(B) a cutter adjacent the path of travel of said strip for severing said strip to form a topwrap sheet,

(C) opposed and spaced supports positioned below said path of travel to support said severed topwrap sheet inwardly from its edges and in alignment with the upper surface of one of said bundles,

(D) a reciprocable placement plate positioned over said supports for temporarily deforming said topwrap sheet and carrying it through said supports to the upper surface of one of said bundles,

(E) a conveyor for continuously moving said bundles into position for receipt of said topwrap sheet, and

(F) a control mechanism for guiding said apparatus through a predetermined cycle comprising

(1) means for actuating said mechanism responsive to passage of said bundles over said conveyor,

(2) first delay means for delaying actuation of said cutter subsequent to actuation of said mechanism,

(3) means for actuating said cutter subsequent to said first delay,

(4) second day means for delaying actuation of said placement plate subsequent to actuation of said cutter,

(5) means for reciprocation of said placement plate subsequent to said second delay,

(6) means for actuating said feeding means subsequent to reciprocation of said placement plate, and

(7) means for preventing the recycling of said apparatus until a previous cycle is completed.

9. An apparatus for placing topwrap sheets on bundles comprising, in combination:

(A) means for feeding a continuous strip of wrapper material,

(B) a cutter adjacent the path of travel of said strip for severing said strip to form a topwrap sheet,

(C) opposed and spaced supports positioned below said path of travel to support said severed topwrap sheet inwardly from its edges and in alignment with the upper surface of one of said bundles,

(D) a reciprocable placement plate positioned over said supports for temporarily deforming said topwrap sheet and carrying it through said supports to the upper surface of one of said bundles, and

(E) means for loading a roll of said wrapper material comprising

(1) a roll compartment having a floor and sidewalls,

(2) a ramp pivotally connected to and extending from said floor between said sidewalls,

(3) guide means adjacent said sidewalls in position to receive said roll when pushed up said ramp, and

(4) roll supports positioned adjacent said guide means to receive said roll from said guide means and to rotatably support said roll for use in said apparatus.

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TRAVIS S. McGHEE, *Primary Examiner.*

U.S. Cl. X.R.

53—131, 389

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,440,796 Dated November 4, 1970

Inventor(s) James Harrison

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 44, "theh" should be --the--;

Column 8, line 52, "day" should be --delay--.

SIGNED AND
SEALED
DEC 29 1970

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents