Dec. 20, 1960 R. POWERS 2,964,895

BOTTOM WRAPPER FEEDER

Filed May 12, 1958 6 Sheets-Sheet 1

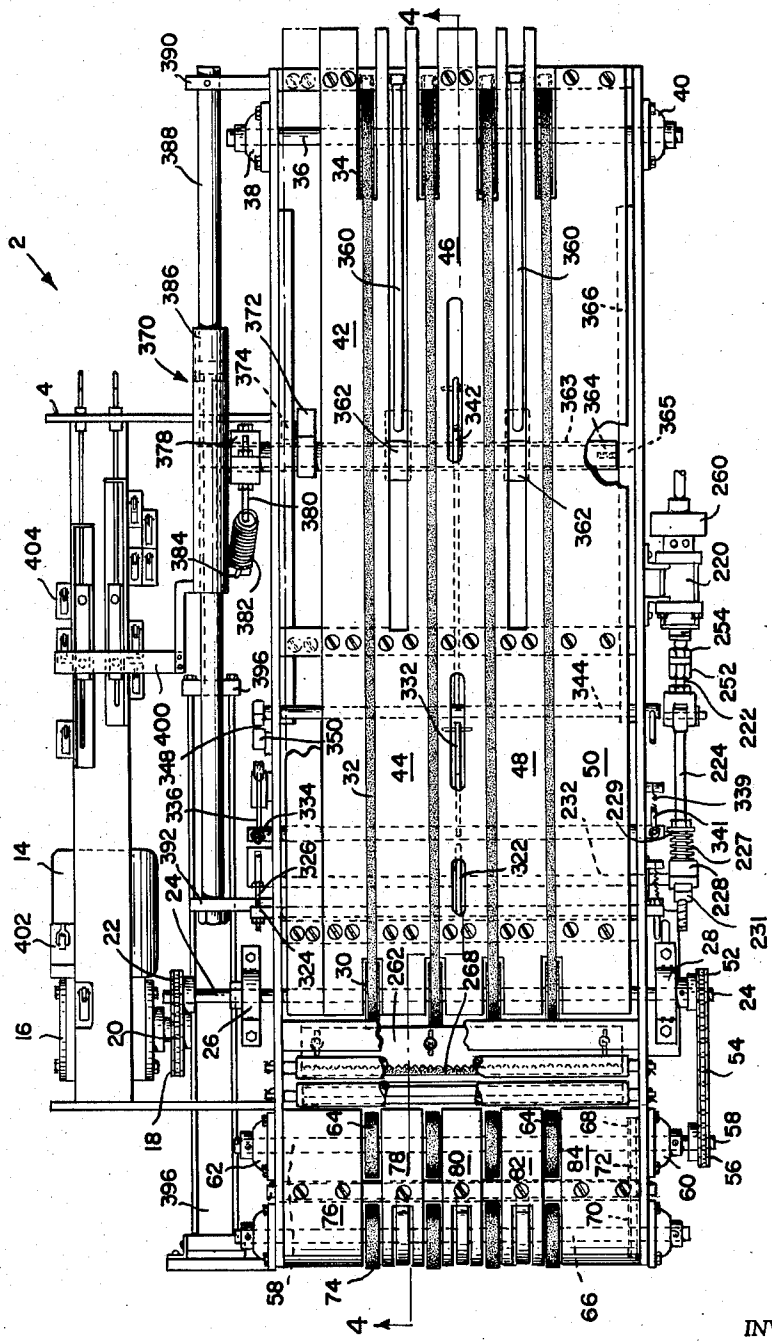


FIG. 1.

INVENTOR.

RICHARD POWERS

BY Brown Smith & Hadj

ATTORNEYS

Dec. 20, 1960 R. POWERS 2,964,895

BOTTOM WRAPPER FEEDER

Filed May 12, 1958 6 Sheets-Sheet 2

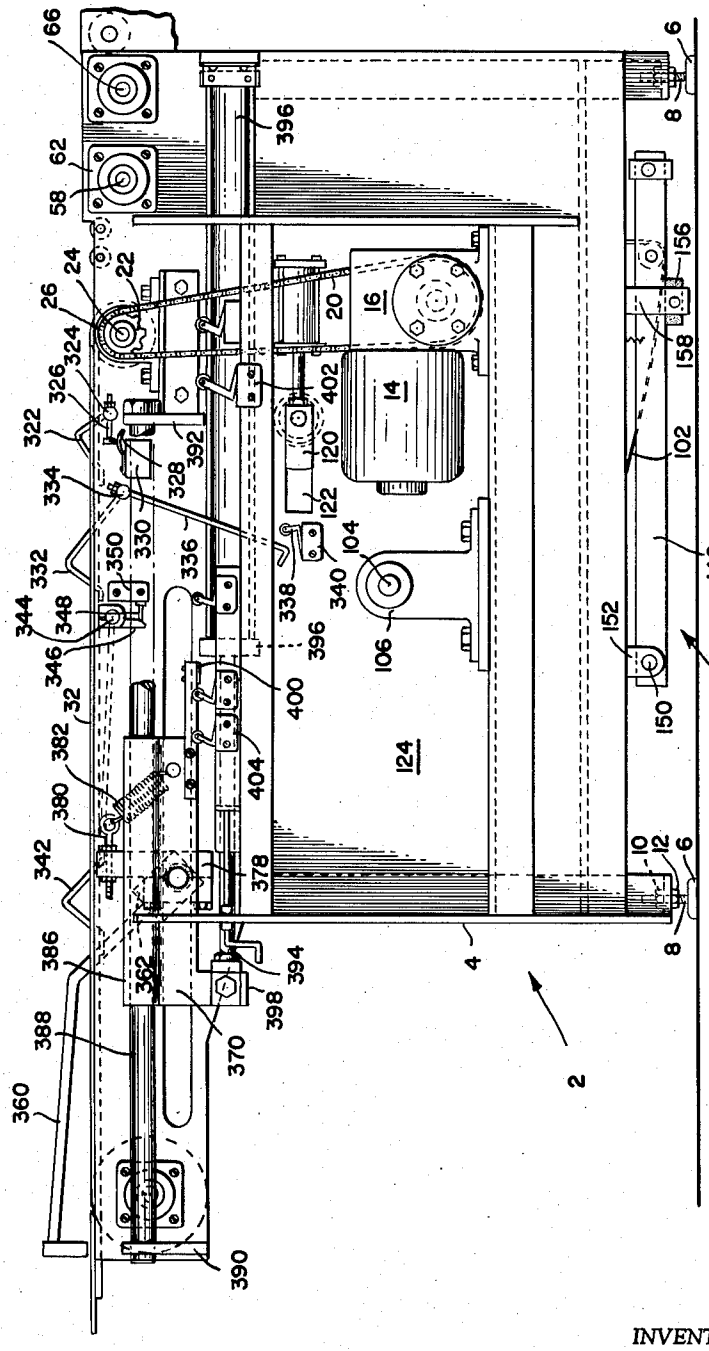



FIG. 2.

INVENTOR.
RICHARD POWERS
BY
Brown Smith & Hardy
ATTORNEYS

Dec. 20, 1960 R. POWERS 2,964,895

BOTTOM WRAPPER FEEDER

Filed May 12, 1958 6 Sheets-Sheet 3

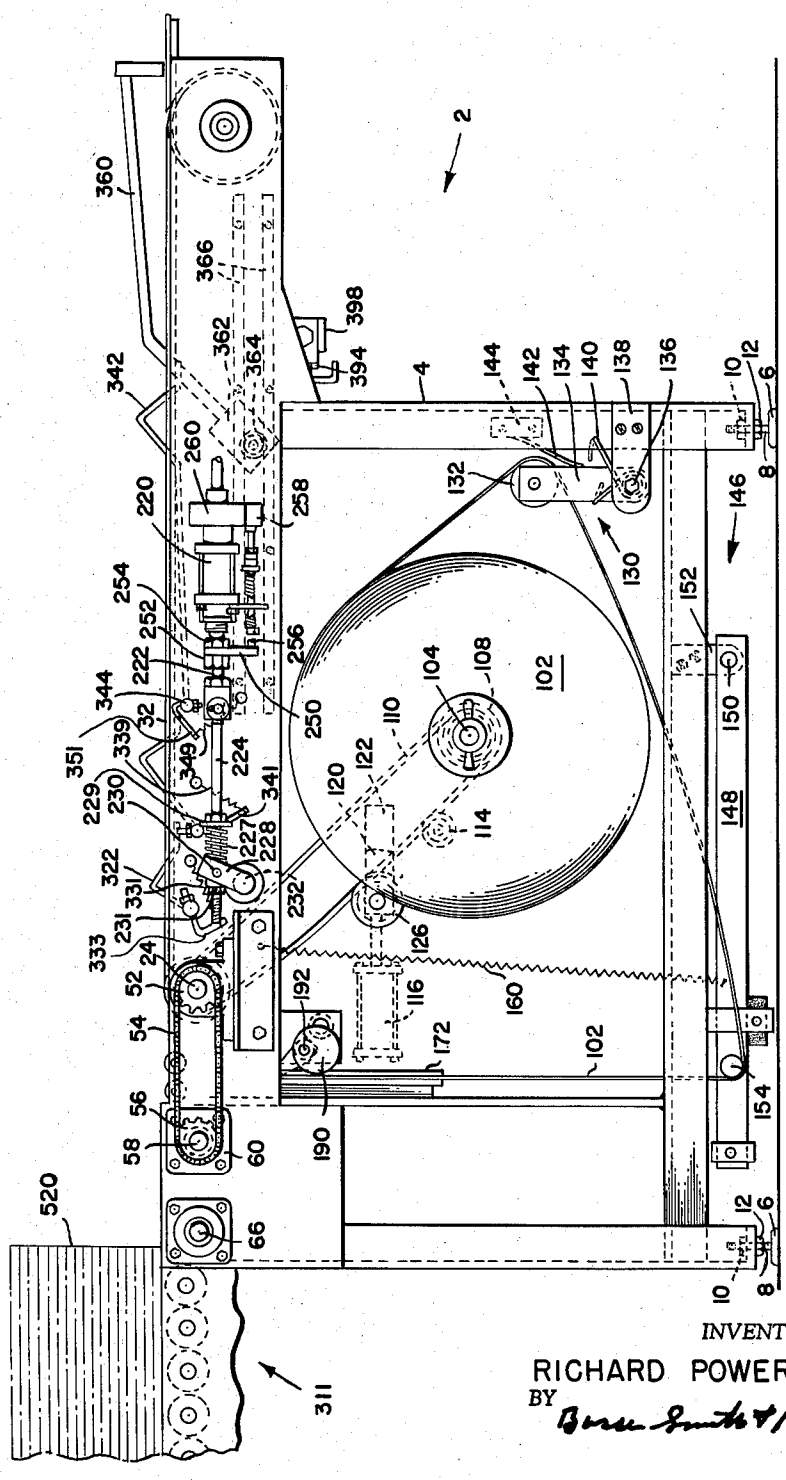



FIG. 3.

INVENTOR.

RICHARD POWERS

BY Brown Smith & Hadj

ATTORNEYS

Dec. 20, 1960 R. POWERS 2,964,895

BOTTOM WRAPPER FEEDER

Filed May 12, 1958 6 Sheets-Sheet 4

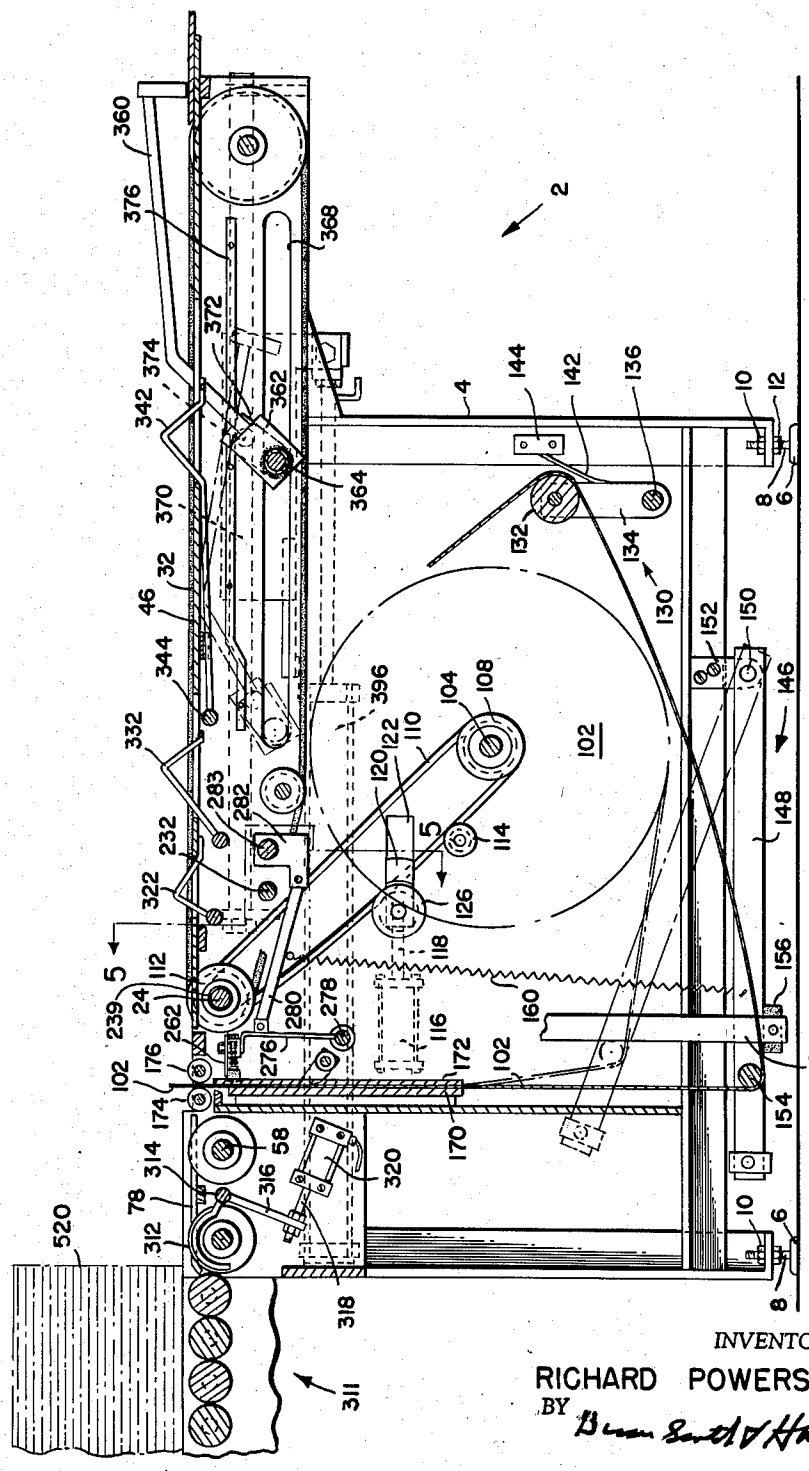



FIG. 4.

INVENTOR.
RICHARD POWERS
BY Brumbaugh & Hardy
ATTORNEYS

Dec. 20, 1960 R. POWERS 2,964,895

BOTTOM WRAPPER FEEDER

Filed May 12, 1958 6 Sheets-Sheet 5

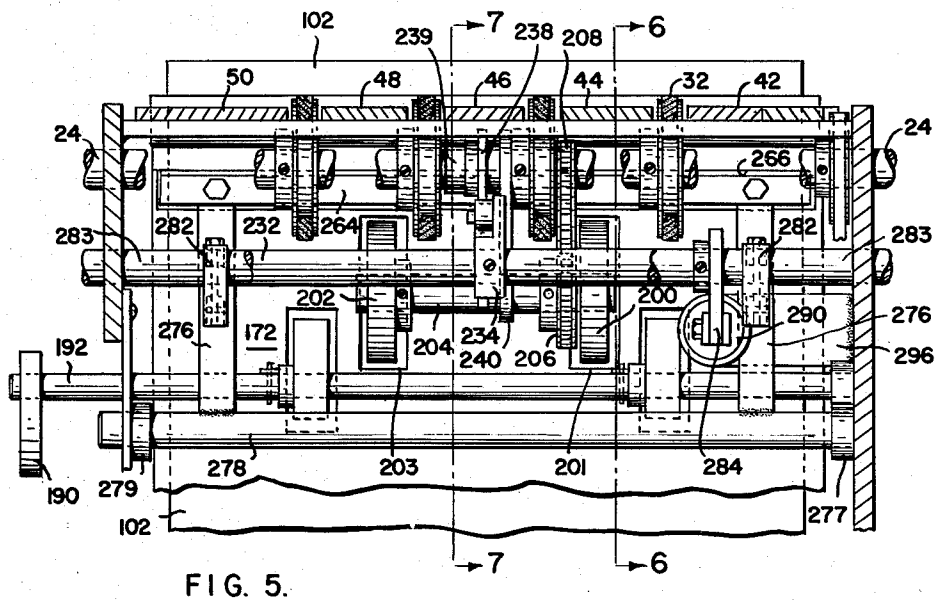



FIG. 5.

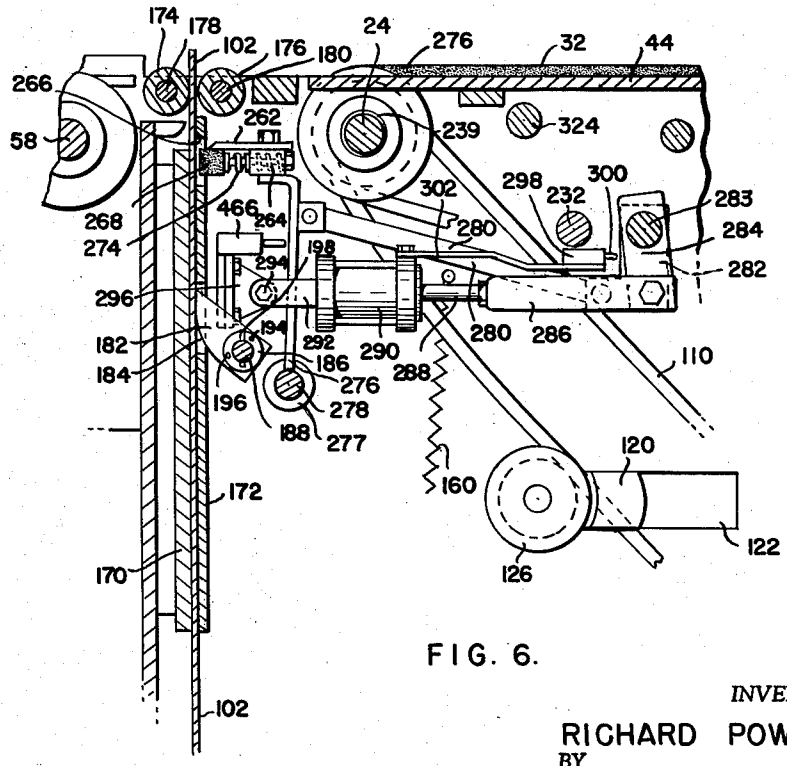



FIG. 6.

INVENTOR.
RICHARD POWERS
BY
Bosse Smith & Hardy
ATTORNEYS

Dec. 20, 1960 R. POWERS 2,964,895

BOTTOM WRAPPER FEEDER

Filed May 12, 1958 6 Sheets-Sheet 6

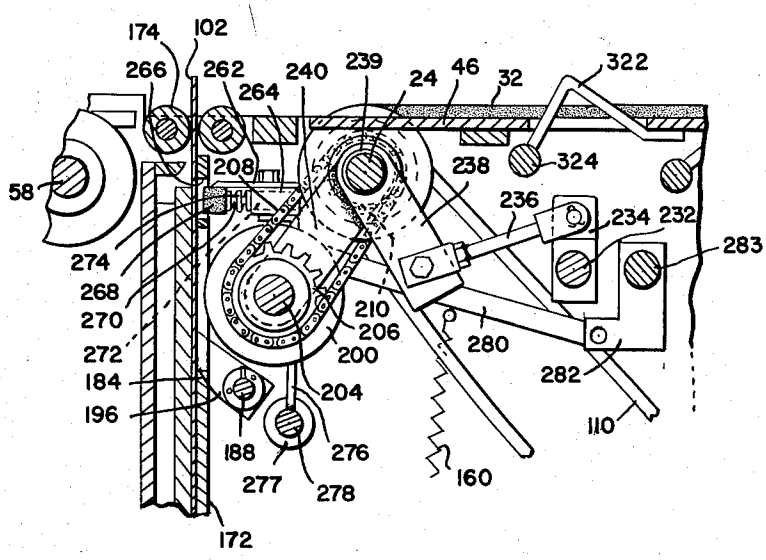



FIG. 7.

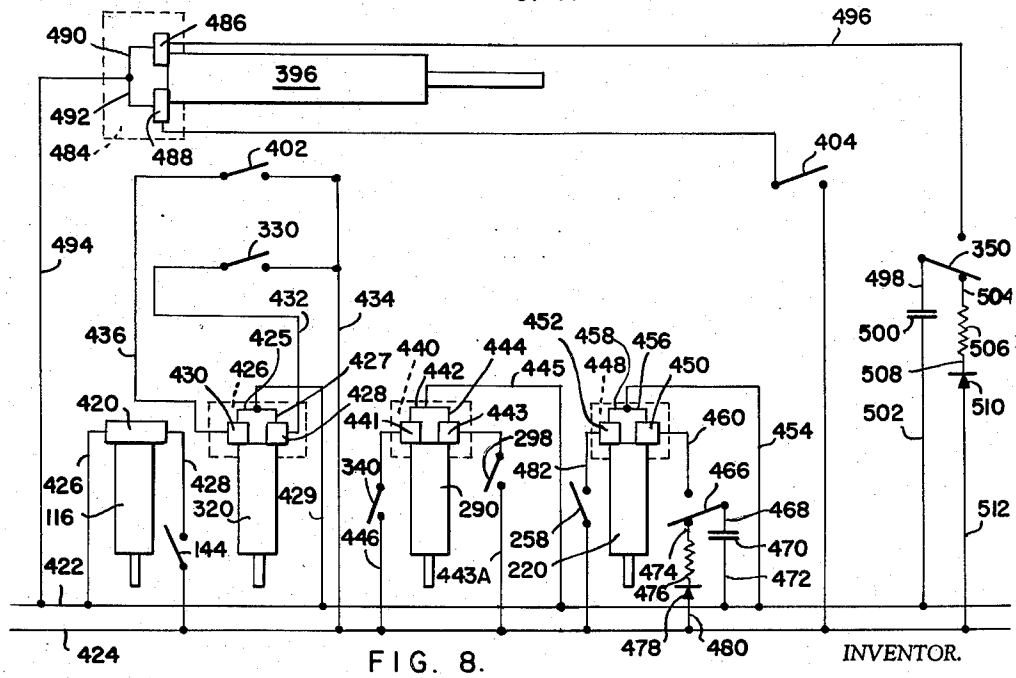



FIG. 8.

INVENTOR.

RICHARD POWERS

BY Brown Smith & Hardy

ATTORNEYS

United States Patent Office 2,964,895 Patented Dec. 20, 1960



2,964,895

# BOTTOM WRAPPER FEEDER

Richard Powers, Broomall, Pa., assignor to Bulletin Company, Philadelphia, Pa., a corporation of Pennsylvania

Filed May 12, 1958, Ser. No. 734,634

2 Claims. (Cl. 53—389)

This invention relates to a machine adapted to feed a wrapper sheet under an article. The machine of this invention has utility, for example, in placing a wrapper sheet under a bundle of newspapers. Since its use in connection with newspaper bundles appears to be typical, this invention will be discussed as applied to newspaper bundles.

This invention further relates to a bottom wrapper feeder having means for advancing articles such as bundles of newspapers off the end of the conveyor portion of the bottom wrapper feeder.

The broad object of this invention is to provide an improved device for placing a wrapper sheet underneath a bundle.

It is a further object of this invention to provide a bottom wrapper feeder in combination with means for advancing bundles off the end of the conveyor associated with the bottom wrapper feeder onto, for example, an adjacent flat surface.

These and other objects of the invention will become apparent on reading the following description in conjunction with the drawings in which:

Figure 1 is a plan view of a device in accordance with this invention;

Figure 2 is an elevation of the left-hand side of the device in Figure 1;

Figure 3 is an elevation of the right-hand side of the device of Figure 1;

Figure 4 is a vertical section taken on the planes indicated by the lines 4—4 in Figure 1;

Figure 5 is a vertical section taken on the lines indicated by 5—5 in Figure 4;

Figure 6 is a vertical section taken on the plane indicated by line 6—6 in Figure 5;

Figure 7 is a vertical section taken on the plane indicated by line 7—7 in Figure 5; and

Figure 8 is a wiring diagram of the control circuit for the device of Figure 1.

As shown in the figures, a device 2 in accordance with this invention has a supporting frame 4 mounted on adjustable feet 6 (Figure 2). Feet 6 have a threaded member 8 secured to frame 4 by nuts 10 and 12.

An electric motor 14 (Figures 1 and 2) with a reduction gear 16 is mounted on frame 4. Reduction gear 16 drives a sprocket 18 which in turn drives chain 20, sprocket 22 and shaft 24, which is mounted in bearings 26 and 28.

Pulleys 30 (Figure 1) driven by shaft 24 carry conveyor belts 32, which are mounted on pulleys 34 fixedly secured to shaft 36 mounted for rotation in bearings 38 and 40. Belts 32 run between conveyor plates 42, 44, 46, 48 and 50.

Sprocket 52 (Figure 3) on shaft 24 drives a chain 54, which drives sprocket 56 and shaft 58 mounted in bearings 60 and 62 and carrying rollers 64 (Figure 1). Shaft 66 (Figure 1) is driven by shaft 58 through sprockets 68 and 70 and chain 72. Shaft 66 carries rollers 74.



Rollers 64 and 74 run between conveyor plates 76, 78, 80, 82 and 84.

A roll of paper 102 (Figure 4) is mounted on shaft 104 rotatably mounted in trunnions 106 (Figure 2). A pulley 108 carrying a belt 110 is fixedly secured to shaft 104. Belt 110 is driven by pulley 112 on shaft 24. Idling pulley 114 engages belt 110.

A ram 116 has a rod 118 secured to block 120 (Figures 2 and 3) which rides in slot 122 in plate 124. Block 120 carries a pulley 126, which is adapted to engage belt 110 when the ramrod 118 is extended in order to take the slack out of belt 110 and cause it to drive pulley 108. When the ramrod 118 is withdrawn belt 110 is too slack to drive pulley 108.

A slack sensing device 130 (Figures 3 and 4) is provided with a roller 132 engaging the paper and mounted on lever 134, which is pivotally secured at 136 to bracket 138. A spring 140 biases arm 134 towards the paper and towards arm 142 of switch 144.

Referring to Figures 2, 3 and 4, a reserve paper supply device 146 has a lever 148 pivotally connected at 150 to a bracket 152. A rod 154 secured to lever 148 is adapted to engage the paper from roll 102. Lever 148 is adapted to rest on a rubber cushion 156 secured to a supporting bracket 158.

Lever 148 is counterbalanced by an extension coil spring 160.

As shown in Figure 6, paper 102 feeds upwardly between plates 170 and 172 and between rollers 174 and 176 mounted for rotation on shaft 178 and 180, respectively. The paper 102 is held from dropping downwardly between plates 170 and 172 by friction retaining members 182 which are made of a material having a high coefficient of friction, for example, rubber. Each member 182 has arcuate face 184 and is mounted on a collar 186 which, in turn, is mounted on shaft 188. Each collar 186 is provided with pins 194 and 196 which are adapted to be engaged by a pin 198 secured to shaft 188 to permit the control of the position of members 182 by means of rotation of handle 192.

Paper 102 is advanced upwardly by rubber wheels 200 and 202 (Figures 5 and 7) which are adapted to pass through openings 201 and 203 in plate 172. Wheels 200 and 202 are fixedly secured to a shaft 204 which carries a sprocket 206 driven by a chain 208 which, in turn, is driven by a sprocket 210 mounted on shaft 24. Thus, wheels 200 and 202 are continuously driven.

The advancement and retraction of wheels 200 and 202 is accomplished by ram 220 (Figure 3) which has a rod 222 connected to rod 224 which, in turn, passes freely through an opening in lever 228 to which it is pivotally secured by a pin 230. A compression spring 227 backed by a ring 229 engages lever 228 on one side and a nut 231 engages it on the other side. Lever 228 is fixedly secured to a shaft 232 to which is fixedly secured a lever 234 (Figure 7). Lever 234 is pivotally connected to a link 236 which is pivotally connected to lever 238 which is fixedly secured to a sleeve 239 rotatably mounted on shaft 24. A lever 240 which is pivotally secured to shaft 204 is fixedly secured to sleeve 239.

Referring to Figure 3, a bracket 250 is secured to rod 222 by nuts 252 and 254 and has secured thereto a rod 256 which is adapted to actuate a switch 258 for reversing ram control valve 260.

Referring now to Figure 7, paper 102 is cut by a knife 262 which is secured to a block 264, the knife being adapted to pass through an opening 266 in plate 172. Also secured to block 264 is a rubber brake member 268 mounted on a rod 270 which is carried in a groove 272 in block 264. A compression coil spring 174 is interposed between brake member 268 and block 264.

Block 264 is fixedly mounted on levers 276 which are fixedly secured to a shaft 278 (Figure 6) mounted for rotation at 277 and 279. Each of levers 276 is also pivotally secured to a link 280 which is connected to a lever 282 fixedly secured to shaft 283. Shaft 283 has fixedly secured thereto a lever 284 which is pivotally secured to a link 286 secured to plunger 288 of ram 290 which, in turn, is pivotally mounted by lever 292 which is pivotally secured at 294 to a bracket 296. A switch 298 has an operating plunger 300 which is adapted to be engaged by the adjacent lever 284. Switch 298 is mounted on a bracket 302 secured to ram 290.

The entry of articles onto the conveyor system from an adjacent conveyor 311 is controlled by a plurality of gate members 312 (Figures 1 and 4) fixedly secured to a shaft 314 which, in turn, is fixedly secured to a lever 316 to which ramrod 318 of ram 320 is secured.

The device of this invention as shown in the figures is provided with a plurality of switch operating members projecting upwardly through conveyor plate 46. (See Figures 1, 2 and 3.) A finger 322 is fixedly secured to a shaft 324 which, in turn, has a headed rod 326 secured thereto. Rod 326 is adapted to engage operating lever 328 of switch 330. Extension spring 331 attached to lever 333 mounted on shaft 324 acts to bias finger 322 upwardly (Figure 3). A finger 332 is fixedly secured to a shaft 334 which has fixedly secured thereto a lever 336 adapted to engage operating lever 338 of a one way operating switch 340. Extension spring 339 attached to lever 341 mounted on shaft 334 acts to bias finger 332 upwardly (Figure 3). A finger 342 is connected fixedly to a shaft 344 which has fixedly secured thereto a lever 346 which is adapted to engage an operating plunger 348 of switch 350. An extension spring 349 attached to lever 351 mounted on shaft 344 acts to bias finger 342 upwardly (Figure 3).

The device is provided with means for pushing the articles conveyed off the end of the conveyor. A pair of pusher arms 360, 360 (Figures 1–4) are each secured to a block 362 which is fixedly secured to a sleeve 363 on shaft 364. Shaft 364 has a roller 365 carried in a track 366, passes through slot 368 and is secured to carriage 370. A lever 372 (Figure 1 and 4) fixedly secured to sleeve 363 on shaft 364 carries a cam follower 374 which engages cam 376. A block 378 (Figure 1) is fixedly secured to sleeve 363 and has secured thereto a rod 380 which, in turn, is connected to an extension coil spring 382 which has its other end secured to the carriage 370 at 384.

Carriage 370 has a bore 386 which encompasses carriage guide rod 388 secured to brackets 390 and 392. Rod 394 of ram 396 is secured to depending portion 398 of carriage 370.

A switch operating arm 400 is secured to carriage 370 and is adapted to engage and actuate switches 402 and 404.

As shown in the wiring diagram of Figure 8 ram 116 which acts to cause the driving of the paper roll, has a solenoid controlled valve 420 which is connected to A.C. power lines 422 and 424 by lines 426 and 428, respectively, line 428 having therein the switch 144.

Gate ram 320 has a two way control valve 426 having a coil 428 which acts to position valve 426 to extend the ram and a coil 430 which acts to position valve 426 to retract the ram. Coils 428 and 430 are connected to line 422 by lines 425, 427, and 429. Coil 428 is connected to line 432 which contains switch 330 which, in turn, is connected to line 434 which is connected to power line 424. Coil 430 is connected to line 436 which contains switch 402, line 436 being connected to line 434.

Knife ram 290 has a two way control valve 440 having a coil 441 which acts to retract ram 290 and a coil 443 which acts to position the valve to extend ram 290. Coils 441 and 443 are connected to line 422 through lines 442, 444 and 445. Coil 441 is also connected to line 424 through line 446 containing one way operating switch 340. Coil 443 is connected to line 424 by line 443A which contains switch 298.

Roller drive ram 220 has a two-way control valve 448 with a coil 450 to position the valve for the extension of the ram and coil 452 to position the valve for the retraction of the ram. Both coils are connected to line 422 through line 454 and respectively through branches 456 and 458. Coil 450 is connected to line 460 which is adapted to be connected by switch 466 to line 460, line 468 and condenser 470 which is connected to power line 422 by line 472. In its normal position switch 466 connects line 468 to line 474, resistor 476, rectifier 478 and line 480 which is connected to power line 424. Coil 452 is connected to line 482 which is connected to line 424. Line 482 contains a switch 258.

Ram 396 which controls the pusher arms has a two-way control valve 484 with a coil 486 which is adapted to position the valve to extend the ram and a coil 488 which is adapted to position the valve to retract the ram. Coils 486 and 488 are connected to power line 422 by lines 490 and 492, respectively, which are, in turn, connected to the line 494. Coil 486 is connected to line 496 which through the operation of switch 350 is adapted to be connected to line 498 which is connected to one side of condenser 500, the other side of the condenser being connected to line 502 which is connected to power line 422. In the normal position line 498 is connected to line 504, resistor 506, line 508, rectifier 510 and line 512 which is connected to power line 424.

*Operation*

A bundle 520, for example, a bundle of newspapers, passing onto the device 2 from an adjacent conveyor 311 (as shown in Figure 4) will be conveyed to the right as viewed in Figure 4 so as to engage the upstanding portion of paper 102 and carry the paper along with it as it is advanced by conveyor belts 32. An adequate supply of paper 102 is provided by virtue of the tautening of belt 110 by the extension of ram 116 causing pulley 126 to take the slack out of belt 110 and, hence, drive pulley 108. Pulley 126 is actuated by the lack of slack in paper 102 moving roller 132 and lever 134 to the left as viewed in Figure 3 which results in the opening of switch 144. A supply of unrolled paper 102 is provided by paper supply device 146 which, on being elevated by the tautening of the paper, reduces the distance the paper must travel and, hence, increases the available supply of unrolled paper.

As the bundle and paper 102 are advanced by belts 32 they operate the fingers projecting upwardly through plate 46 as will now be described. Finger 322 is depressed to close switch 330 which actuates ram 320 to elevate barrier members 312 and thus prevent additional bundles from advancing onto the device 2. Next, finger 332 is depressed momentarily closing switch 340 which energizes coil 441 which positions solenoid control valve 440 to cause the retraction of ram 290. Ramrod 288 advances link 286 to the left as viewed in Figure 6 which rotates link 284 and, hence, shaft 283 clockwise as viewed in Figure 6 to cause link 280 and lever 276 to advance knife 262 so as to cut paper 102, member 268 holding paper 102 momentarily as it is cut. Just after knife 262 cuts paper 102 lever 284 closes switch 298 by depressing operating plunger 300. The closing of switch 298 energizes coil 443 causing control valve 440 to shift and causes ram 290 to extend thus reversing the above discussed motions and retracting knife 262 to the position shown in Figure 6. As lever 284 is withdrawn from plunger 300 switch 298 opens thus completing a cycle of knife operation. As the bundle leaves finger 332 lever 336 swings back past switch 340 which, being a one way operating switch, does not close.

When lever 276 was pivoted to the left as shown in Figure 6 during knife operation as above described, it

engaged switch 466 causing it to connect lines 468 and 474 resulting in the charging of condenser 470. As knife 262 is withdrawn and lever 276 moves away from switch 466 the latter shifts to engage line 460 and the shorted condenser discharges causing the momentary energizing of coil 450 which positions control valve 448 to cause the extension of ram 220. As viewed in Figure 3, the extension of ram 220 causes rods 222 and 224 to be moved to the left and rotate lever 228 to, in turn, move shaft 232 counterclockwise as best seen in Figure 7. Shaft 232 carries lever 234, link 236, lever 238 and lever 240 so as to advance wheels 200 into engagement with paper 102. The wheels 200 being turned continuously as viewed in Figure 7 by shaft 24, sprocket 210, chain 208, sprocket 206 and shaft 204, act to move sheet 102 upwardly so as to project above rollers 174 and 176 to permit engagement by the next bundle. Rod 224 having caused wheels 200 to engage paper 102 continues to advance slightly to compress compression spring 227. When spring 227 is partially compressed bracket 250 has moved rod sufficiently to close switch 258 which actuates switch 258 and causes ram 220 to retract, reversing the above discussed movements and withdrawing wheels 200 from paper 102.

The advancing bundle then depresses finger 342 which causes switch 350 to connect lines 398 and 504 which results in the charging of condenser 500. As the bundle releases finger 342 switch 350 connects line 498 to line 496 and the shorted condenser discharges to provide a pulse which energizes coil 486 to position valve 484 to cause ram 396 to extend. As viewed in Figures 1 and 4, this results in the advancement of carriage 370 to the right, carrying with it shaft 364 and pusher arms 360, 360. Spring 382 urges cam follower 374 upwardly against cam 376 whose configuration permits pusher arms 360 to be pivoted upwardly as they are moved to the right. Thus, pusher arms 360 are raised upwardly above the conveying belts 32 and are in position to engage a bundle, and advance the bundle to the right as shown in Figures 1 and 4.

As carriage 370 advances switch operating arm 400 closes switch 402 which reverses control valve 426 and causes ram 320 to retract thus lowering barrier members 312. Switch operating arm subsequently engages switch 404 to close it thus reversing control valve 484 and causing ram 396 to retract to its starting position. The arms 360 being spring biased upwardly are capable of retracting back under a bundle which has advanced over the arms.

It is not desired to be limited except as set forth in the following claims.

What is claimed is:

1. A machine adapted to feed a wrapper sheet under an article comprising conveyor means adapted to convey an article, said conveyor means having an opening transverse to the direction of travel of the conveyor for the passage of a wrapper sheet upwardly above the conveyor, guide means to guide a wrapper sheet upwardly so as to pass through said opening, brake means to prevent a wrapper sheet from moving downwardly through said guide means, a knife below said opening and adapted to sever said wrapper sheet below said opening, means to operate said knife, means responsive to an article being conveyed to actuate said knife operating means, means to advance the wrapper sheet upwardly to a point above the conveyor after it has been cut, and means for advancing an article away from the discharge end of the conveyor comprising a pusher arm, a ram, means to pivotally connect said ram and said arm and to position the arm behind an article on the conveyor when the ram moves in one direction and to retract the arm clear of the conveyor to permit free passage of an article on the conveyor when the ram is moved in the opposite direction.

2. A machine adapted to feed a wrapper sheet under an article comprising conveyor means adapted to convey an article, said conveyor means having an opening transverse to the direction of travel of the conveyor for the passage of a wrapper sheet upwardly above the conveyor, guide means to guide a wrapper sheet upwardly so as to pass through said opening, brake means to prevent a wrapper sheet from moving downwardly through said guide means, a knife below said opening and adapted to sever said wrapper sheet below said opening, means to operate said knife, means responsive to an article being conveyed to actuate said knife operating means, means to advance the wrapper sheet upwardly to a point above the conveyor after it has been cut, and means for advancing an article away from the discharge end of the conveyor comprising a pusher arm mounted below the upper surface of the conveyor, a ram, means to pivotally connect said ram and said arm and to elevate the arm behind an article on the conveyor when the ram moves in one direction and to retract the arm clear of the conveyor to permit free passage of an article on the conveyor when the ram is moved in the opposite direction.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 2,156,460 | Plass | May 2, 1939 |
| 2,636,654 | Sykes | Apr. 28, 1953 |
| 2,746,224 | Wollett | May 22, 1956 |
| 2,803,930 | Schmidt | Aug. 27, 1957 |
| 2,816,408 | Powers | Dec. 17, 1957 |
| 2,860,462 | Sykes | Nov. 18, 1958 |
| 2,879,636 | Zuercher | Mar. 31, 1959 |
| 2,882,659 | Daniels | Apr. 21, 1959 |